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JOURNAL OF BOTANY

AND

KEW GARDEN MISCELLANY.

EDITED BY

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Notes on the American Species of MYRISTICA; *by* GEORGE BENTHAM, ESQ.

Five species of American Nutmegs are enumerated in the last edition of Steudel's 'Nomenclator,' but this number must be reduced to four, as Martius has shown that the *M. Bicuhyba* of Schott is identical with his own *M. officinalis*, and I am not aware of any new species having been since published. The recent discoveries however of Hostmann in Surinam, of Gardner and others, and more especially of Spruce, in Brazil, have added no less than nine distinct species, making a total of thirteen South American *Myristicæ*, now more or less known*.

There is some discrepancy in the generic characters as given in general works with regard to the male flowers. Endlicher gives the number of anthers as six to fifteen, Swartz limits them to three in the two American species known to him. To me they appear to vary both in number and form from three to six or eight (in the American species), and to afford convenient characters for arranging the species, in

* I am aware that Kunth, in the seventh volume of the 'Nova Genera et Species,' published a *Myristica Orinocensis*, omitted by Steudel. He had however only a very imperfect male specimen to examine, and it is evident that the structure he describes is much at variance with all known modifications of *Myristica*. The bivalvate involucre, ciliated calyx, free anthers, varying in number, etc., suggest an affinity to *Peridium* among *Euphorbiaceæ*, and, to my mind, a probable identity with *Schismatopera* of Klotzsch.

the same way that modifications of the same organs in the Asiatic species have served as foundations for the subgenera or sections *Myristica*, *Knema*, and *Pyrrhosa*.

The American *Myristicæ* are generally lofty trees, of which the first ramifications are, according to Mr. Spruce, almost always in fives, although the subsequent branches are irregularly alternate. The leaves are smooth on the upper side, and when young more or less clothed on the underside as well as the young shoots with a stellate down, which either entirely disappears in the adult leaf, leaving the under surface more or less glaucous, or persists and grows in the form of a rusty down. The lateral veins diverging from the midrib are regular and parallel, and are usually connected within the margin, the reticulated smaller veins being generally inconspicuous. Two species, *M. carinata* and *M. punctata*, have the leaves completely covered with minute transparent dots, particularly conspicuous in the young leaf, whilst in the others I can find no trace of them; at least, in the adult leaf. The flowers, both male and female, are arranged in little heads or umbels, which are themselves distributed in axillary panicles, sometimes nearly simple and racemose, sometimes very much branched, ample, and crowded with minute flowers. The female panicles are less branched than the male, but never reduced to one or to a very few flowers as in most Asiatic species. Each little head or umbel is, when young, enclosed in bracts, which are so very deciduous that they are seldom to be seen in dried specimens. The calyx appears to be constantly trifid or tridentate. The ovary in the very few species in which I have seen the female flower is crowned by two small sessile ovate stigmata.

The aromatic properties of the American Nutmegs are described as analogous to those of the Eastern species, but coarser, and the chief use made of them appears to be the extraction of a wax for making candles; whilst the bark of most species yields an acrid medicinal oil, too caustic to be used otherwise than for external application.

The following is a synopsis of all the American species known to me.

§ 1. *Antheræ* 3, *rarius* 4–6, *oblongæ; columna gracilis, parte nuda antheris æquilongi v. longiore.*—(The lateral veins in this groupe are usually numerous, and run straight nearly to the edge of the leaf.)

1. M. *carinata*, Spruce, sp. n.; foliis petiolatis anguste oblongis ob-

tusis vix acuminatis basi rotundatis subtus glaucis vix tomentellis, paniculis ramosis laxiusculis, calyce profunde trifido, antheris 3, columna filiformi pluries brevioribus, fructu globoso glabro.

The male specimens were gathered from a tree of about sixty feet, with the trunk two feet in diameter. The leaves, which are not yet fully grown, are from 3½–5 inches long, scarcely an inch wide, and very copiously dotted with minute transparent dots, with a few small stellate hairs scattered on the under surface, the veins very divergent and not strongly marked; the petiole 2–3 lines long. The panicles (as in all the American species, covered with a short rusty down) are about half the length of the leaves, with very divaricate branches and not very crowded ochraceous sweet-scented flowers. The bracts small and orbicular; the calyx very small with deeply cleft recurved lobes. These specimens were gathered by Mr. Spruce, in October, in the forest at the mouth of the Rio Negro, in North Brazil. The fruiting specimens, which appear to me to belong to the same species, were gathered near Barra in February, from a slender tree of about 35 feet, branching only at the top. The full-grown leaves are 6–8 inches long, firm and more or less complicated and keeled by the prominent midrib; the lateral veins are more prominent, and, owing to the thickened texture, the minute pellucid dots can only be seen with a strong light. The inflorescence is the same as in the males. The drupe-like fleshy capsules about 9 lines in diameter, of a glaucous-green when fresh; aril scarlet.

2. M. *venosa*, sp. n.; foliis petiolatis ellipticis vix acuminatis basi rotundatis acutisve subtus glaucis venis valde obliquis, novellis vix tomentosis, paniculis brevibus parce ramosis, calyce profunde trifido, antheris 3 oblongis columnæ parte nuda brevioribus.

This was a slender tree of about 20 feet. Leaves 4–6 inches long, 2–2½ inches broad, more or less blunted at both extremities, or sometimes slightly acute, but never narrowed into a long point; the parallel veins are much more oblique and longer than in the other species. The male panicles about an inch long, the small flowers nearly sessile; the staminal column slender, but not so long as in *M. carinata*.

Found by Mr. Spruce in the Capoeiras, near Barra, in March.

3. M. *officinalis* (Mart. Reise, vol. i. p. 343); foliis petiolatis oblongis v. ovato-oblongis acuminatis basi rotundatis ibidemque revolutis et in petiolum decurrentibus novellis subtus tomentosis, paniculis brevibus racemiformibus, antheris 3–6 oblongo-linearibus columnæ parti

nudæ subæquilongis (fructu globoso glabro).—*M. Bicuhyba*, Schott in Spreng. Syst. Cur. post. p. 409.

Leaves much shorter than in *M. fatua*, narrower than in *M. venosa*, and readily known by the peculiar form of their base. The flowers are few and small.

Grows in the forests of the provinces of Rio Janeiro and Bahia. The specimens I have examined are from Martius, Herb. Bras. n. 650, and Gardner, Rio Janeiro, n. 5596. Its chief use appears to be medicinal, although Martius states his opinion that by cultivation the aromatic properties of its nutmeg might be much improved.

4. M. *fatua* (Sw. Fl. Ind. Occid. p. 1126); foliis breviter petiolatis anguste oblongis basi rotundatis subtus pallidis subtomentosis, paniculis amplis decompositis, calyce profunde trifido, antheris 3 oblongis columnæ parte nuda brevioribus (fructu ovali v. subgloboso). —*M. Surinamensis*, Roland. ex Sw. l. c.—*M. sebifera*, var. *longifolia*, Lam. Dict. vol. iv. p. 391, ex descr.

Leaves usually 6–8 inches long and scarcely an inch broad, or in luxuriant specimens near a foot long and 1½ inch broad; the veins numerous, nearly transverse, and reaching very near the margin. The bracts much larger than in the other American species; the flowers numerous, on pedicels rather longer than the calyx.

Common in Guiana; it appears to extend from Parà to the West Indies. My specimens are from St. Vincent (Anderson), British Guiana (Rob. Schomburgk, 2nd Coll. n. 950, Rich. Schomb. n. 1257), Surinam (Hostmann, n. 786), and Caripe near Parà (Spruce). It is there known by the name of *Ucu-uba*, or *Oil-tree*. The nut, according to Rolander (quoted by Swartz), is used, when fresh, in lieu of the real nutmeg, but loses its aromatic properties in a week.

5. M. *subsessilis*, sp. n.; foliis brevissime petiolatis anguste oblongis basi anguste cordatis subtus pallidis demum glabris, paniculis brevibus parum ramosis, calyce profunde trifido, antheris 3 (rarius 4–6) anguste oblongis columnæ parte nuda brevioribus, fructu oblongo tomentoso.

Leaves very nearly those of *M. fatua* in general form and dimensions, but they are emarginate at the base close to the very short petiole (barely 1 line long). The inflorescence is that of *M. officinalis*, or rather more branched. The fruit is very different, being olive-shaped, about 9 lines long, and covered with a rusty down.

From Gardner's Piauhy collection, n. 2775.

§ 2. *Antheræ* 6, *lineares; columna crassa, parte nuda brevissima v. subnulla.*—(The lateral veins of the leaves usually more distant than in the first groupe, more curved and running together by anastomosed veins at a greater distance from the margin.)

6. M. *elongata*, sp. n.; foliis petiolatis lanceolato-oblongis longe acuminatis basi rotundato-cuneatis subtus glaucis, paniculis brevibus ramosissimis, calyce breviter trifido, antheris 6 linearibus, columnæ parte nuda brevissima.

Flowers much like those of *M. sebifera*, but smaller. The leaves are very different, being from 6–9 inches long and only $1\frac{1}{2}$ inches broad, tapering at the upper end into a long point.

I have a single male specimen gathered (probably by Langsdorff) at Borba on the Rio Madeira, and communicated by the Imperial Academy of St. Petersburg under the name of *Bicuhyba*. It is however very different from the *M. officinalis*, Mart.

7. M. *cuspidata*, Spruce, sp. n.; foliis petiolatis ovali-ellipticis v. ovato-lanceolatis longe cuspidatis basi rotundatis subtus tomentosis impunctatis, paniculis laxis floribundis, calyce tridentato, antheris 6 linearibus columnæ parte nuda brevissima.

Nearly allied to *M. elongata*, but the leaves twice as broad, and the panicles very much more ample. The petioles are 4–5 lines long, the leaf itself 6–8 inches long by $2\frac{1}{2}$–3 inches broad, ending in a point more than an inch long; the consistence and venation is that of *M. sebifera*, but they are less downy and never cordate at the base. The flowers are also about the same size, but the pedicels much longer.

Gathered by Mr. Spruce from a slender tree of about 15 feet by forest streams, near Barra do Rio Negro.

8. M. *sebifera* (Sw. Fl. Ind. Occid. p. 1129); foliis petiolatis amplis ovatis v. late oblongis basi late cordatis subtus ferrugineo-tomentosis impunctatis, paniculis decompositis folio brevioribus, calyce tridentato, antheris 6 linearibus columnæ parte nuda brevissima, fructu subgloboso tomentoso.—*Virola sebifera*, Aubl. Pl. Gui. p. 904. t. 345.

This forms a tree which, according Aublet, will grow to the height of 60 feet, but is found in flower and fruit from 20 feet high upwards. The leaves are generally from 6–10 inches long by $2\frac{1}{2}$–3 inches broad, but I have seen them more than a foot long and 4 inches broad. The lateral veins are rather distant and arcuate. The fruits that I have seen

are of the shape and size represented by Aublet, t. 345, fig. 4 and 5. Those represented fig. 6 and 7, which are twice the size, may very likely, as stated by Aublet, proceed from a mere variety, but fig. 8 and 9 are so very different in shape that they must surely belong to some perfectly distinct species.

Evidently a very common tree in Guiana and North Brazil. My specimens are from British Guiana (Rob. Schomburgk, 1st coll. n. 711, 2nd coll. n. 588, 907 and 991, Rich. Schomb. n. 906, 1402, and 1713), French Guiana (Martin), Surinam (Hostmann, n. 635), Parà and Santarem (Spruce), and province of Goyaz (Gardner, n. 3566). I find no record of any use of the fruit except as furnishing a vegetable wax for candles, and the acrid red juice extracted from the bark, as in the case of other species, is used medicinally.

9 ? M. *theiodora*, Spruce, sp. n.; foliis breviter petiolatis amplis ovatis v. late oblongis acuminatis basi late subcordatis subtus glaucis vix tomentosis impunctatis, paniculis decompositis folio brevioribus, . . . fructu subgloboso ferrugineo-tomentoso.

Tree of 20 feet, with leaves like those of *M. sebifera*, but rather broader, less cordate at the base, and much less downy underneath; the fruit rather larger and borne on thicker and longer pedicels. I should nevertheless, in the absence of flowers, have considered it as a mere variety of that species, had not Mr. Spruce assured me that it is perfectly distinct. The leaves, when drying, are said to emit a strong odour of tea.

Gathered in March in the forest about Barra do Rio Negro by Mr. Spruce.

10 ? M. *punctata*, Spruce, sp. n.; foliis breviter petiolatis amplis oblongo-lanceolatis basi rotundato-truncatis crebre pellucido-punctatis subtus glaucis vix tomentosis, paniculis (fructiferis) brevibus dense ramosissimis, fructu globoso obtusissimo tomentoso.

Leaves longer than in *M. sebifera*, and not so broad, not at all cordate although broad at the base; the pellucid dots very distinct and copious. Fruit-panicles scarce 2 inches long and broad. Fruits numerous, smaller than in *M. sebifera*, with very short stalks.

A slender tree, of about 16 feet, found by Mr. Spruce in the moist forest about Barra do Rio Negro.

11 ? M. *macrophylla*, Spruce, sp. n.; foliis brevissime petiolatis amplis oblongo-ellipticis breviter acuminatis basi anguste rotundatis subtus

ferrugineis impunctatis, paniculis (fructiferis) brevissimis glomeratis, fructu globoso rugoso glabro.

A tree of about 35 feet, with very hard wood. Leaves thicker and more leathery than in the other species, from 9–18 inches long by 3–4 inches broad, narrowed near the base but rounded next the petiole. Fruit on short stalks branching from the base, rather larger than in *M. sebifera*, but without any trace of down, drying black, and with a very uneven surface even when fresh.

Found by Mr. Spruce by a stream near Barra do Rio Negro.

Although in the three last species I have not seen the flowers, I have little hesitation, from their general aspect and foliage, in referring them to this section.

§ 3. *Antheræ 6–8, parvæ, ovatæ, circa columnæ apicem peltato-dilatatum insertæ, parte nuda antheris multo longiore.*—(Lateral veins of the leaves much arched and anastomosing at a considerable distance from the margin.)

12. M. *Hostmanni*, sp. n.; foliis breviter petiolatis ovali-ellipticis acuminatis basi rotundatis cuneatisve, paniculis brevibus parum ramosis, calyce profunde trilobo lobis rotundatis, antheris 6–8 ovatis columna apice peltato-dilatata multo brevioribus.

A tree of about 25 feet. Leaves (5–7 inches long by 2–3 broad) and inflorescence very much resembling those of *M. Otoba*, as figured by Humboldt and Bonpland, but the petioles are very much shorter, the leaf itself of a rusty colour (when dry) underneath, but not downy, and there are no perceptible pellucid dots. The lobes of the calyx are nearly orbicular and white, according to Hostmann. The staminal column reminds one in some respects of some of the Asiatic species of the section *Knema*, but the anthers are less numerous and the dilated part not perceptibly toothed.

Shady forests of Surinam, Hostmann, n. 1162 and 1181.

To the above must be added—13. M. *Otoba*, Humb. et Bonpl. Pl. Æq. vol. ii. p. 78. t. 103, which is unknown to me. The female flower, if correctly figured, is very different from that of any other species known to me. It is from the neighbourhood of Bogotà, and is said to supply the coarse strong-smelling nutmegs of that country.

I take this opportunity of adding the characters of some new *Anonaceæ* from Mr. Spruce's last collections.

1. Anaxagorea *brevipes;* foliis oblongis cuspidatis coriaceis, pedunculis solitariis (bifloris) fructiferis petiolum brevissimum excedentibus, folliculis tenuiter lepidotis.—*Arbor* parva (20-pedalis). *Folia* 6–8 poll. longa, circa 2 poll. lata, petiolo vix 2-lineari, longiuscule cuspidata, basi rotundata, consistentia quam in cæteris speciebus multo firmiora, venis minime pellucidis. *Flores* haud vidi. *Pedunculi* fructiferi circa 3 lin. longi. *Calyx* parvus, infra fructus patens. *Receptaculum* et folliculi iis *A. phæocarpi* a Martio depictis similia. *Ovaria* ultra 12, folliculi tamen abortu sæpius pauciores, cum stipite pollicares v. paulo longiores, in vivo (teste Spruceo) lutei stipite coccineo, in sicco castanei.

From the forest about Barra do Rio Negro.

2. Guatteria *pteropus;* glabrescens, foliis elliptico-oblongis cuspidatis costatis basi abrupte contractis et secus petiolum decurrentibus, pedunculis 1–3-nis glabriusculis infra medium articulatis, sepalis ovatis, petalis obovato-oblongis ferrugineo-tomentellis.—*Arbor* gracilis, 20-pedalis. *Ramuli* fusci, novelli tenuissime ferrugineo-tomentelli. *Folia* semipedalia, circa 3 poll. lata, cuspide acutiusculo, versus basin angustata v. rotundata, ima basi cuneata et secus petiolum semipollicarem usque ad basin decurrentia; novella minute puberula, adulta supra glabrescentia haud nitida, subtus minutissime ferrugineo-tomentella, consistentia rigide membranacea, costa media subtus valde prominente, venis primariis etiam prominulis parallelis angulo fere recto a costa divergentibus et intra marginem tenuiter arcuato-confluentibus. *Pedunculi* 8–9 lin. longi. *Bracteæ* minutæ, squamæformes. *Sepala* 2 lin. longa, obtusiuscula. *Petala* (an perfecte evoluta?) 5 lin. longa, undulata, primum ferruginea, dein canescenti-tomentella, in vivo roseo-virescentia. *Baccæ* haud visæ.

From the forest on the north shore of the Amazon River at the mouth of the Rio Negro. Easily recognized by the winged petiole.

3. Anona (Guanabani) *sessiliflora;* arborea, ramis glabris v. strigillosis, foliis (subpedalibus) oblongis v. obovali-oblongis cuspidatis basi in petiolum brevem angustatis rigide membranaceis supra glabris subtus strigillosis, floribus 1–3-nis subsessilibus, sepalis ovatis acutiusculis, petalis rotundatis crassis acutiusculis dense sericeis, interioribus vix brevioribus.—*Folia* 3–4 poll. lata, acumine pollicari. *Bracteæ*

parvæ, orbiculatæ. *Flores* aperti pollicem diametro. *Petala* intus per totam partem concavam glabra, apice uti extus sericea. *Torus* glaber. *Antheræ* numerosæ, subsessiles, 1 lin. longæ. *Ovaria* glabra.

On the south shore of the Rio Negro, towards its confluence with the Solimões.

4. Duguetia *longicuspis;* ramulis cano-tomentosis, foliis anguste oblongis longe cuspidatis basi rotundatis supra glabris subtus lepidotis pallescentibus, pedunculis brevissimis lateralibus solitariis, bracteis minutis, petalis (pollicaribus) ovatis cano-tomentosis calyce duplo longioribus.—Affinis *D. Quitarensi* et (ex descr.) *D. Spixianæ*, distinguitur ramulis, petiolis, costa paginæ inferioris, et floribus tomento brevissimo incanis. *Folia* 6–8 poll. longa, 1½–2 poll. lata, apice in acumen pollicare contracta, rigidule membranacea. *Pedunculi* circa 2 lin. longi. *Sepala* late ovata, acuta, fere 6 lin. longa. *Petala* perfecte evoluta, fere pollicaria, obtusa, pallide purpurea.

A small tree, on the Lago do Alexo, near the mouth of Rio Negro.

5. Rollinia *resinosa*, Spruce, MS.—*R. glaucescens*, Miq. Stirp. Surin. p. 108 (1851), non Sond. Linnæa, vol. xxii. p. 557 (1849).

A small tree from Matinho, near Barra do Rio Negro, with shining black bark, minutely dotted with grey; the flowers aromatic and the leaves, when bruised, emitting a strong resinous odour, whence Mr. Spruce derived his name. It appears to be not uncommon in Guiana, and is well described by Miquel, whose name I suppress with regret, it having been previously applied by Sonder to a Minas Geraes species. Besides Hostmann's Surinam specimens I have others from British Guiana numbered 942 in Sir Robert Schomburgk's collection, or 1302 in that of his brother Richard.

AMERICAS EGEVEGETATION, etc. (*The Oak-vegetation of America;* abridged from two popular lectures delivered before the Association of Natural History of Copenhagen, and separately reprinted.) By Professor F. LIEBMANN. Copenhagen, 1851. Translated from the Danish, by Dr. WALLICH, F.R.S., V.P. Linn. Soc.

(*Continued from p.* 327.)

All the Oaks of tropical Mexico are of the so-called evergreen sort; with some apparent exceptions, to be noticed hereafter.

Alexander von Humboldt has placed the lower limits of the Oaks on the eastern coast of Mexico, at 400 toises, or 2400 feet; an assertion which proves, how precarious it is, to draw general conclusions from inadequate data. Since Humboldt, during his journey in Mexico, became acquainted with the state of vegetation on the eastern slope of the Cordilleras, by one single route only, from Jalapa to Vera Cruz, his statement should, in justice, be applied exclusively to that line, and not be extended beyond; for then it will be found incorrect. And yet has this Humboldtian view of the lowest limit of the Mexican Oaks, on the east side of the Cordilleras, been repeatedly quoted, as an undoubted fact, which it cannot be, unless expressly limited in the manner which we have indicated; because both north and south of that line Oak-forests are met with, down to the very coast in the Department or State of Vera Cruz. It is *Q. oleoides* which thus extends to the very coast; a handsome, not very large tree, growing in clumps, and forming small groves on the savanas, rarely small forests. These savana-groves possess much picturesque beauty, by breaking the monotony of the extensive grass plains. The tree has shining leathery leaves; the stem and branches are mostly covered by masses of parasites with magnificent flowers, such as Orchideæ, Tillandsiæ, Pipera, Visca, and Loranthi. Among the first we may name the splendid *Schomburgkia tibicina*, many fine *Epidendra*, *Oncidia*, *Maxillariæ*, etc.; while the known grey-bearded *Tillandsia usneoides* hangs down from the branches and wafts its delicate fibres to the winds.

As it rises imperceptibly from the shore, the country produces, at an elevation of 2–3000 feet, an increased number of Oak species: small trees with stiff, mostly woolly leaves, forming small open forests on the low ridges or margins of the deep volcanic ravines, which intersect the east coast. They disappear in low situations, fertilized by the soil which has been washed down, and also in the barraukas, or ravines, where, with a want of light, there exists likewise too great moisture. As characterizing this belt we may name *Q. petiolaris*, *tomentosa*, and *affinis*.

The Oaks at an elevation of 3000 feet become loftier and more stately; they form dense forests, and increase considerably in the number of species. Here the heat becomes already more temperate (17° C. mean temperature), and the fall of rain is great; the climate is the finest one can desire. It is concerning this portion of the region

of Oaks that the opinion prevails, that on reaching it, there is security against the yellow fever, black vomit, and typhus, which prevail on the coast. This opinion, though correct and founded on experience, admits of being extended much further than the inhabitants suppose; for it applies also to those parts of the coast, which are occupied by the above-mentioned low species of Oaks; these grow only in localities where there is a brisk change of air, a free outlet of moisture, and where no accumulation of putrescent vegetable matter can take place. The heat here, though very great, exercises no deleterious influence on the health. I have never heard the herdmen, who constitute the scanty population of the savanas, where the coast Oaks are produced, speak of those diseases; and I have nowhere been myself in better health than there. The principal species which distinguish this region are, *Q. Jalapensis*, one of the largest of Mexican Oaks, with smooth, toothed leaves; *Q. Alamo*, a stupendous tree with large, coriaceous leaves, woolly and white underneath; *Q. polymorpha*, a small crooked species with woolly, grey leaves; *Q. Mexicana*, with lanceolate, willow-like leaves; *Q. Ghiesbregtii*, a very fine tree, having smooth, entire leaves; besides several undescribed species. They are ornamented by a crowd of parasites; climbing *Aroideæ* embrace and partly conceal the stems, with their large, fleshy, and shining foliage; *Philodendra* hang down from the branches in festoons; while large tufts of fine-flowered *Orchideæ* (*Læliæ*, *Epidendra*, *Odontoglossa*, *Marmodes*, *Stanhopeæ*, *Trichopiliæ*, and many others), several variegated *Tillandsiæ*, with other Ananas-like plants and also Ferns, and herbaceous *Pipera*, cover the surface of the trees, and perform the same office as Mosses and Lichens do in our forests. Under the shade of the Oaks grow *Chamædoreæ;* and on their roots remarkable parasites are found, such as the scarlet *Monotropa coccinea*, and *Conopholis sylvatica*, which answer to our *Orobanche.*

A variety of woody twiners connect the stems and render the forests impenetrable; such as *Banisteria*, *Paullinia*, *Serjana*, thorny *Sarsaparillas*, and climbing *Rubi*. The wild Vine surmounts the tops of the trees and there intermingles its countless pendulous clusters of glaucous-blue grapes with the acorns*.

* On felling a large Oak, which was to an unusual extent overwhelmed by a wild Vine, sixteen large baskets of grapes were gathered, yielding 180 bottles of juice, which was made into an excellent vinegar.

On the margin of the forests is found an exceedingly handsome sort of Bamboo (*Arundinaria*), shooting up tufts of stems to a height of 25 feet, which are not thicker than a goose-quill, have verticillate thread-like branches, from which the bright green and grass-like leaves hang down, and form one of the most beautiful vegetable objects I have ever met with. The tall, tough, and slender stems bend into light curves in all directions, like the rays of a fountain. These few features may to some extent suffice to give an idea of those fine Oak-forests, in which the naturalist will find most ample matter for research.

Beyond this rich region of plants, at an elevation of 3000 feet, the gently sloping plains cease; mountainous lands succeed, and we find ourselves already at the foot of the Cordilleras. Palms are no longer met with; woody Ferns have taken their place. We are now at an elevation of between 4000 and 5000 feet, at which the town of Jalapa is situated, whose climate and fine vegetation are so vividly described by Humboldt. The cool atmosphere, the great moisture, and the uneven territory are conditions so favourable for the production of the Oak, that it is here it reaches its maximum in Mexico; and we find accordingly that dense forests of many sorts cover the mountain-sides. Besides those of the preceding regions, alluded to above, a number of other remarkable species make their appearance, surpassing by the size of their fruit all others hitherto known; only few of them have as yet been described. To these belong *Q. Galeottii*, with leaves like those of the Beech, and globular nuts of the size of a pigeon-apple; and next after this *Q. insignis*, with leaves like the Chestnut, the cup measuring 8 inches and the nut 6 inches round, by 2 in diameter, and 1½ in length.

Although here, as everywhere else in Mexico, the Oaks are evergreen, yet they are nearly leafless during a very short period of the year. This is occasioned by the violent northerly winds (*Nortes*) which frequently prevail during the winter months, from December until February, and are accompanied by a cold rain. The leaves are gradually blown off; but it is only in February, immediately before the period of blossoming, that this state reaches to such an extent, that during a fortnight the Oaks appear almost leafless. Many elegant parasites, which had almost escaped attention before, are now in flower on the Oaks, such as *Juanulloa parasitica*, *Columnea Schiedeana*, many *Echeveriæ*,

Orchideæ, and *Tillandsiæ*. As soon as this *Norte*-period is over, the Oaks begin to blossom. In the course of a few days they assume a splendid gold-coloured tint, owing to the countless aments which cover all the branches, the young leaves burst forth simultaneously, and scarcely eight days have elapsed before the trees again assume their rich fresh foliage. It is a brief, but a distinctly marked spring, which in this manner unfolds itself. While this spring lasts in this and the preceding region, large cocoons of silk, of an ell in diameter, are seen hanging down from the branches of the Oaks. They derive their origin from a gregarious sort of silkworm, which spins itself into a large common habitation, which gradually increases in circumference. The worms leave the cocoons at night and spread over the Oak, in order to devour the young foliage, drawing a thread of silk along with them, which is fixed at one end on the outside of the cocoon; towards morning they return again to their home, which is now enlarged by the addition of a new thread from each worm. In this manner about 800 silkworms associate together in one common cocoon, which thus become augmented at the rate of 1600 threads each.

The period of ripening of the acorns is from September to November, during which season the Oak-forests more than usually teem with life, on account of the many animals that are allured by the fruit. They resound with the screeching of numberless parrots, and the noise caused by the cracking of the nuts, which fall to the earth like dense showers of rain, and are eagerly devoured by the *Nasua*, *Procyon*, and *Dicotyles*, and by squirrels. Short, regular knocks are heard, which might be taken for those of some people at work cutting timber, but which will be found to proceed from a handsome species of woodpecker, which the natives, on that account, call *the carpenter* (*carpentero real*), zealously occupied in picking symmetrical rows of holes in the bark of the Oaks, into which it inserts acorns picked up from the ground. In the acorns are lodged unhatched insect eggs; and it is only some time after their maggot has consumed the kernel, that the woodpecker returns to break the nut, and consume the well-fed worm.

We now ascend the Cordilleras to an elevation of between 6000 and 7000 feet, where Pines begin to mingle with the Oak. The latter continue still to predominate, forming the leading constituents of the forest; but further upwards they gradually decrease, being now succeeded by the Pines. The predominant species are *Q. lanceolata*, *lau-*

rifolia, and *glabrata*. Many of them form only dense thickets, interwoven with numerous *Convolvuli*, among which is the important medicinal *C. Purga*. Climbing woody grasses, species of *Panicum*, ascend the branches. In these forests we now meet with many sorts of trees, which remind us of Europe, such as the Hornbeam, Lime, Willow and Cornel, mixed with a multitude of noble trees of the Laurel tribe.

At an elevation of 8 to 10,000 feet the Oak is only found scattered singly among the Pines. It has thick woolly leaves, and mostly long fruit-stalks, or racemes of fruit. We find here *Q. spicata*, *reticulata*, *chrysophylla*, *pulchella*, and others. The more perfect parasites now almost entirely disappear, only some sorts of *Viscum* still continuing; but Mosses and Lichens abound on the Oaks. Long beards of *Usnea barbata* hang down from the branches, in the same fashion as *Tillandsia usneoides* in the hot region. It is only upon the volcano of Orizaba at an elevation of 12,000 feet that the Oak ceases entirely.

Having thus given a sketch of the changes, which the Oak undergoes in the various regions, from the torrid coast of Mexico to the highest points on the eastern Cordilleras, we now proceed to the Oak-vegetation in the interior of the country.

The immense highlands, which occupy the greatest proportion of the interior of Mexico, are separated by high Cordilleras from both coasts towards the east and west, and are besides subdivided into various large and small tracts by chains of mountains; the smaller tracts having the appearance of long valleys, the bottom of which nevertheless is elevated from 5000 to 8000 feet above the sea. The climate is temperate and dry; the vegetation scanty, but peculiar. It is only where the mountains are so elevated, as to reach beyond the lower cloud-belt, that the climate becomes moister and the woody forms more powerful; forests cover their sides, while the highlands and the low hills are almost devoid of trees. This causes a great obstacle to the establishment of industrial and manufacturing pursuits in the interior; which will be easily understood when it is recollected, that the most populous towns in Mexico are situated on its highlands, or in such valleys as are under the similar conditions with these; that fuel is expensive, on account of the great distance it has to be brought on mules, through the most difficult mountain-paths, and in small loads. It is principally the Oak which affords fuel in the interior of Mexico; enormous quantities being likewise converted into charcoal. Such has been the destruction of

Oak-forests during the last 300 years, on account of the many rich silver-mines at St. Louis Potosi, Guanajuato, and Zacateca, that the smelting of silver is at the present day attended with enormous expenses for the purchase and transport of charcoal alone. It may be easily conceived, that it has been found necessary to relinquish the working of even the richest copper and iron mines on account of their disproportionate costs; for charcoal had to be brought eighty leagues on clumsy small carts; which was the case especially in regard to the copper-mines at Mazapil and Saltello.

The Oak-vegetation in the northern states of the interior is very numerous as regards species; but almost all the trees are low and stunted; often only shrubby; not forming dense forests, but standing in small groups on the precipitous sides of mountains. Many species have large, coriaceous, often rugose, tomentose leaves, and small fruits. They occur chiefly at elevations from 6000 to 8000 feet, and do not produce the same pleasing impression with the Oaks on the eastern Cordilleras; their weak, crooked stem, the few irregularly spreading branches, and stiff, lead-grey leaves giving them a sombre appearance, still further augmented by the loads of pendulous ash-grey *Tillandsia usneoides*, which often cover the Oaks entirely. To give some idea of the extent of species found on those arid mountains in the interior of Mexico, I will mention the following from the silver district Real del Monte: *Q. crassipes*, *Mexicana*, *lanceolata*, *laurina*, *tridens*, *depressa*, *ambigua*, *glaucescens*, *chrysophylla*, *pandurata*, *rugulosa*, *Grahami*, *glabrescens*, *repanda*, *barbinervis*, *crassifolia*, *obtusata*, *callosa*, *nitens*, *reticulata*, *confertifolia*, *sideroxyla*, etc.

These species are again found on all the mountains of the interior of Mexico, from Zacateca to Oajaca. In the silver district of the eastern mountains of the State of Oajaca, I have met with nearly all the species which I first knew only from Real del Monte.

It is notorious that the ancient, original seat of the cochineal culture, was on the mountains of Oajaca. The climate on the higher mountains of 8000 to 9000 feet is rough and unsteady, and therefore unfavourable for the delicate cochineal insect; nevertheless its culture succeeds among the Indians, though with great difficulty; each separate little insect having to be protected on the flat branches of the *Opuntia*, by means of sheds made by attaching the stiff Oak-leaves to them; for which purpose *Q. crassifolia* is used. Its tender leaves look like the

most beautiful scarlet velvet, on account of the dense felt which covers them; as they advance in growth, the red colour changes into pale yellow or whitish, the felt on the surface is rubbed off, and a dull green colour succeeds; they become very thick, almost cartilaginous, fragile, with the margin recurved, so as to resemble the hollow of a hand or spoon, whence the natives call the tree the Spoon Oak (*encina de cuchara*). *Q. dysophylla*, *spicata,* and *callosa* have similarly thick leaves.

In the eastern valleys of Oajaca, the Oak descends to an elevation of a few thousand feet only. The relative condition is here nearly as in the eastern slope of the Cordilleras. Among the Oak-forms here, we may name the remarkable *Q. Skinneri,* first known from the western coast of Guatemala, having a nut of 5½ inches in circumference; further *Q. salicifolia* and *tomentosa.* In the valley along the Rio de las Vueltas, I have again met with *Q. petiolaris,* found also on the eastern slope of the Cordilleras at an elevation of 2500 feet. The Oaks which ascend highest on the Oajaca Cordilleras (*Sempoaltepec*, *Pelado*, *Cumbre de Ocote*, and *Tauga*) are found at an elevation of 10,000 to 11,000 feet, in the form of crippled shrubs, only a couple of feet high.

The western Cordilleras have Oak-forests like the eastern, but they are little known, because their investigation by travellers is attended with great difficulties; the mountains being exceedingly scantily inhabited; and a protracted sojourn in those high regions where the Oak is found, being within reach only of the wealthy naturalist. My journey across the western Cordilleras towards the southern happening at a season, when the acorns were very little developed, the determination of species became impossible; my data concerning these are therefore scanty. The Oak-forests of that part are far from being so fine as those of the eastern Cordilleras, resulting from the dryness of the climate; I may name among the species *Q. nitida*, *acutifolia*, *glaucescens*, and *callosa.*

The nature of the vegetation of Guatemala is as yet extremely imperfectly known. There exists no connected account of it whatever. It is not to botanists that we stand indebted for the species from thence, but to collectors in other walks of life, who have gathered specimens of growing plants about their places of residence, and transmitted them to Europe. We owe to the English merchant Skinner, the English collector Seemann, and the known German collector Hartweg,

what specimens we possess of Guatemalan Oaks. But we are deficient in all sort of information, concerning the conditions in which they were found. We may nevertheless conclude from their agreement with the Mexican Oaks, to some similarity with the localities of the Oaks in its Southern States. Thus Q. *tomentosa, callosa, Skinneri*, and *tenuifolia* are common to both; while Q. *brachystachys, undulata*, and *conspersa* are peculiar to Guatemala. The Oaks are very much on the decrease in Nicaragua and Costa Rica; according to Oersted, they are found only on the volcanoes, between 7000 and 10,500 feet elevation; and the few species which have been brought thence to Europe are characteristic*.

In South America the Oak is wanting in the littoral chain of Venezuela, and the high isolated mountain-chain of St. Martha. But it reappears again in the Cordilleras of New Granada, in three species discovered by Humboldt and Bonpland. These southernmost Oaks of America are Q. *Tolimensis*, found at an elevation of 6000 feet in 4° 27′ N., Q. *Almaguerensis*, and lastly Q. *Humboldtii*, a fine tree with globular fruit, found in 1° 54′ N., at the height of 6600 feet.

Descriptions of some remarkable TIBETAN PLANTS; *by* THOMAS THOMSON, M.D., F.L.S., Assistant Surgeon of the Bengal Army.

(TAB. IX.–XII. of Vol. IV.)

1. CORYDALIS.

Caule esquamato simplici v. ramoso glabro, foliis glaucis glabris trisectis crassissimo-carnosis segmentis subrotundo-cuneatis 3–5-lobatis, lobis inciso-crenatis omnibus apice rotundatis, bracteis cuneatis inferioribus incisis. (Tab. IX.)

Corydalis crassissima, *Camb. in Jacq. Voy. t.* 11.

Rhizoma subterraneum, elongatum, horizontale, ex apice caulem annuum erectum 3–6-uncialem sæpius 1-foliatum proferens. *Folia* radicalia longe petiolata, tripartita, segmentis fere orbicularibus late obcuneatis trilobis vel obtuse tridentatis, rarius pinnatipartita, pinnis latera-

* While reading the last proof, I received from the large Royal Herbarium at Berlin a rich collection of American Oaks, and among them a large number of species from Guatemala and Central America, collected by the Prussian Warczewitz. Most of them are not yet described.

libus minoribus obcuneato-trilobis, terminali maximo. *Folium* caulinum sessile, tripartitum, segmentis latissimis rotundatis trilobis, lobis tridentatis. *Racemus* densus, bracteis magnis obcuneatis integris vel trilobis. *Flores* unciales, pallide viridescentes, purpureo variegati, pedicellos subæquantes. *Petala* exteriora obtusa, apice emarginata. *Calcar* longum, obtusum, incurvum.

HAB. In montibus Tibetiæ occidentalis.

This curious little species of *Corydalis* is not uncommon on the mountains of Western Tibet, at the elevation of 15–16,000 feet, growing in warm situations and often among stones, which generally cover the stem and leaf-stalks, so that nothing but the head of dull purplish flowers is visible. Though usually much smaller than the specimens described and figured by M. Cambessèdes, I can find no marked difference between that and my species, which indeed was collected in the same district of country. The shape of the calycine scales is extremely variable. In my figure a very common form is represented, but they are often much more mucronate and occasionally quite as much elongated as in the figure quoted.

PLATE IX. Fig. 1. Flower. 2. Sepal. 3. Pistil :—*all magnified.*

2. SISYMBRIUM PRIMULÆFOLIUM, n. sp.

Foliis radicalibus caulem superantibus obovatis seriatis inferne longe attenuatis, caulinis parvis ovato-oblongis sessilibus, sepalis persistentibus erectis cylindricis.

Radix crassa, fusiformis, tuberculata. *Folia* omnia radicalia, late spathulata, longe petiolata, versus apicem dentata. *Scapi* e collo plures, supra medium bracteati. *Bracteæ* ovato-oblongæ, inferiores vacuæ, superiores floriferæ, sed infra flores supremos sæpius minutæ vel plane nullæ. *Pedicelli* bracteas vix æquantes, patentes. *Sepala* oblonga, basi æqualia. *Petala* obcuneata, indivisa. *Siliquæ* sepalis petalisque marcescenti-persistentibus stipatæ, cylindrico-subulatæ, vix subcompressæ, rectæ vel sæpius incurvæ (ut videtur vix dehiscentes). *Valvæ* membranaceæ, tenuissime reticulato-nervosæ. *Dissepimentum* completum, membranaceum, 1-nerve. *Replum* validum. *Semina* numerosa, alterna ; *cotyledones* 0 ‖ ; *radicula* sæpe oblique subtorta.

HAB. In monte Hattu Himalayæ occidentalis, alt. 10,000 ped., in rupibus madidis. Junio mense fere defloratum legi.

This is in many respects a very puzzling plant ; technically the cha-

racter agrees pretty well with *Sisymbrium*, unless the pods should prove to be permanently indehiscent. Those which I possess show no tendency to dehiscence, but though sufficiently advanced to exhibit the structure of the embryo, they are certainly immature. Notwithstanding the remarkable habit, I am unwilling to propose a new genus on imperfect materials, and therefore for the present leave it doubtfully in *Sisymbrium*.

PLATE X. Fig. 1. Flower. 2. Same with the perianth removed. 3. Petal. 4. Stamen. 5. Pod. 6. Same with the valves removed. 7. Seed. 8. Embryo :—*all magnified*.

3. CHORISPORA SABULOSA, Camb. in Jacq. t. 15.

Foliis radicalibus longe petiolatis lanceolatis integerrimis vel dentatis vel sæpius pinnatifidis nec raro pinnatipartitis, scapis racemosis, floribus pallide purpureis, sepalis linearibus oblongis obtusis erectis exterioribus basi gibbosis apice stellatim pilosis, petalis obcuneatis retusis, siliquis junioribus glanduligeris demum glabris torulosis rostratis, articulis 3–6 replo persistente demum secedentibus subglobosis.

Chorispora sabulosa, *Cambess. in Jacquem. Voy. Bot. t.* 15.

HAB. In humidiusculis et subsalsis Tibetiæ occidentalis, altitudine 10–13,000 ped.

The specimen figured exhibits the usual state of the plant. The plate in Jacquemont's Voyage represents a large specimen in a very advanced state. The leaves, which vary much in shape, are often quite as much divided as in *C. elegans*, Camb., which seems to be nothing but a form of the present species, no character, except a slight difference in the degree of emargination of the petals, being pointed out.

PLATE XI. Fig. 1, 2. Flowers. 3. Petal. 4. Stamens and ovarium. 5. Stamen. 6. Ovarium. 7. Pod. 8. Pod with valves removed. 9. Seed :—*all magnified*.

4. DILOPHIA, genus novum.

Gen. Char. Sepala elliptica. *Petala* membranacea, spathulata, retusa vel irregulariter dentata. *Stamina* 6 ; filamenta subexserta, fere æquilonga. *Glandulæ tori* 4, magnæ, stamina solitaria utrinque stipantes. *Ovarium* pedicello crasso brevi stipatum, late ovatum, fere orbiculare, didymo-compressum, biloculare, stylo crasso brevi conico apiculatum. *Stigma* obtusum. *Ovula* in quoque loculo 4. *Silicula*

sepalis petalis staminibusque marcescentibus munita, utrinque oblique circumscissa, replo late alato membranaceo, valvis dorso gibbosis tuberculatis et quasi cristatis; *dissepimentum* latissime fenestratum, demum fere evanidum. *Embryo* 0 || ||.

Dilophia *salsa*.

HAB. In salsis paludibus Tibetiæ occidentalis, alt. 12–17,000 pedum.

Herba pusilla, depressa, e collo prolifere ramosissima, ramis divaricatis prostratis. *Folia* anguste spathulata, oblonga vel linearia, integra vel sinuato-dentata. *Flores* numerosissimi, racemis in umbellulas densas contractis, basi foliis stipatis.

PLATE XII. Fig. 1. Leaf. 2, 3. Flowers. 4. Petal. 5. Stamen. 6, 7. Pods. 8. Replum and dissepiment. 9. Seed. 10. Embryo:—*all magnified.*

DR. CHARLES BOLLE, *on his Journey to Fuerteventura and Lancerotte.* (*Translated from a letter addressed to* P. B. WEBB, ESQ.)

The "antiquæ Purpurariæ" have been as thoroughly explored as the season permitted. I have rambled over Fuerteventura from the point of Handia to the Bocayna and the Isle of Lobos; and beyond the Bocayna, through all Lancerotte, from Papagayo to Haria. I was a little too late in the season, and my herborizations have not been so fruitful as I could have wished. Lancerotte and Fuerteventura, like the Cape Verd Islands, are green only after the autumnal rains; even in the month of April they are as bare as our fields in Germany are in March.

I landed first at the Gran Carajal, and, beginning well, found at once *Tribulus cistoides* and a species of *Boerhaavia.* Handia next furnished me a harvest of some interest, particularly as Bourgeau remained there only one day, and it was visited neither by you nor by Berthelot.

The lofty Black Mountains descend gradually towards a cape formed by a yellow-tinted stony plain, surrounded by rocks of slight elevation, almost hidden beneath beds of sand and the triturated remains of land-shells. The vegetation here is formed of shrubby *Chenopodiaceæ*, *Euphorbia Paralias*, a creeping *Linaria* with yellow flowers, an *Ononis*, a *Lotus*, a *Gnaphalium*, and *Zygophyllum Fontanesii*, on which I found an *Orobanche.* My attention however was more particularly called to a small Cruciferous plant with rose-coloured flowers and spirally convoluted fruit*; M. Berthelot assures me he never saw it before. The

* Probably *Malcolmia maritima*, R. Br. (P. B. W.)

mountains of Handia form a perpendicular wall towards the north, whilst their southern side is intersected by long ridges, between which are valleys sloping gently down to the torrid African beach. The clouds borne by the trade-winds rest stationary on the northern side, so that, unable to pass over the crest of rocks, they abandon all the southern coast to the most frightful sterility. Fuerteventura, at its southern extremity, possessed doubtless, like Lancerotte at Famara, a zone of evergreen forests, which descended perhaps very low, but which has receded and disappeared before the great destroyer—man; a few remains now only mark the spot. Suspended over horrid precipices, or seated on the lofty and inaccessible cornices of the Pico de la Zarza and the Pico del Frayle, the *Arbol de la Cumbre*, the wild olive, and another low shrub, still brave the axe and the teeth of the goats. Seen from below, these little woods look like black marks on the grey rock. This *Arbol de la Cumbre*, of which I obtained a few specimens in fruit with great difficulty, and at the risk of breaking my neck, is nothing but the *Catha cassinoides*. I found established under its shade and around it a little flora, exclusively Handian, composed of an *Argyranthemum*, of four *Petrophyes*, of an *Aichryson*, a *Leucophaë*, a *Micromeria*, a splendid frutescent *Bupleurum*, unluckily without flower or fruit, and an *Echium* with white flowers veined with azure, whose habit is more Caboverdian than Canarian. Three Ferns, the *Asplenium acutum*, Bory, and *palmatum*, and the *Polypodium vulgare*, clothe the humid ledges of the rocks, and the ground is enamelled with the golden flowers of the *Ranunculus Teneriffæ*. With the exception of this little verdant region, the whole mountain is overrun by the *Nauplius sericeus*, a plant eminently social, whose flowers exhale a strong odour of Elder, while an *Orobanche*, as yet probably undescribed, feeds on its roots. Here and there you meet with different species of *Cichoraceæ*, and amongst them a fine *Andryala*, and tufts of a beautiful *Cerastium** with pendent branches and flesh-coloured flowers.

The southern side is a true Arabia Petræa; the *Nauplius* again appears in mass, with little mimic forests of *Kleinia neriifolia*, mixed with the stunted tree-like *Tabayba dulce* (*Euphorbia balsamifera*), of which some enormous individuals may be seen on the heights, resembling, with their branches interlaced, their tabular summits, and their almost quadrangular contour, the altar of Delos, built by the infant

* Probably *Rhodalsine procumbens*, Gay. (P. B. W.)

Diana, if we may have faith in tradition, of the horns of wild goats. With these grow an *Artemisia*, then flowerless, a little *Galium*, *Notochlæna vellea*, and a *Conyza*. Around the few rare sources are *Apium graveolens*, Maiden-hair, *Gnaphalium luteo-album*, *Glaux maritima*, wanderers and cosmopolites. On the coast appear an *Indigofera*, *Resedella subulata*, *Reseda crystallina*, and a *Lobularia*. Adding to these the *Messerschmidia*, the *Periploca lævigata*, *Rubia fruticosa*, and a sprinkling of very common plants, and I think I have given you a fair idea of the Florula of the Handian peninsula. I must not forget however the *Euphorbia Canariensis*, never seen by me elsewhere in the two Purpurariæ. I need not add, what Bourgeau told you, that Despréaux's story of his having found here a *Melianthus* is false.

And now we must cross the Hablé, that desert which, still more than the Cyclopean wall built by the aborigines, separates Handia from the rest of Fuerteventura. In this Libyan solitude nothing is wanting to recall the picture of the great Sahara, not even the bones of camels, half enveloped in the folds of the waves of sand. But we have no time to stop; aloft on our dromedary we will pass quickly through the whole length of this, the longest of the Canaries, the hapless Fuerteventura, which years of drought and misery have depopulated and despoiled of cattle and forests. At length we reach the strait of the Bocayna, which, rolling on like a mighty river, separates us from Lobos. A light canoe lands us on a strand of the whitest and finest sand that can be imagined. Your Canarian idyl, 'A day passed at Graciosa,' was renewed, but how recite it in this short letter? It requires an entire "Miscellanée!"* More prudent than the Gascon knight, companion of the Norman Béthencourt, Gadifer de la Salle†, we had brought with us an ample store of eatables, of wine, and above all of water.

This little islet is not, like Graciosa, given over to woody *Chenopodeæ*. The *Euphorbia balsamifera* is likewise abundant here, and attains truly astonishing dimensions. The flora of Lobos is characterized too by the exuberance of its *Statices*, which sometimes reign exclusively and without rivals. I observed three species, and amongst them *S. papillata;*

* See Miscell. Canar. p. 191.

† "En l'isle de Loupe, où il estoit allé pour avoir des peaux de loups marins pour la nécessité de chaussures, qu'il falloit aux compagnons, et y demeura tant que vivres lui faillirent, et il estendoit un drap toutes les nuits, qu'il tordoit tous les matins pour estancher sa soif, car la dite isle est déserte et sans eau douce."—*Relation des Chapelains de Béthencourt.*

the two others are certainly new to the Canarian Flora, and perhaps undescribed. One of them is a little shrub formed of large tufts, woody and decumbent below, displaying with pride its beautiful panicles of rose-coloured flowers; the other is more modest and herbaceous, and has blue flowers.

And now I invite you to a feast of *gangas* and *houbaras** *truffés.* I have found *real* truffles at Handia, at Mexorata, and indeed throughout all Herbania†,—delicious white truffles! I have seen whole baskets of them gathered and exchanged by the ignorant Majoreros against an equal quantity of potatoes. These truffles grow but little below the surface of the soil in dry places, and almost always at the foot of the "Turmero," or *Helianthemum Canariense;* their presence is revealed by slight cracks in the ground above them.

At Lancerotte, at the foot of the chain of Famara, I found another *Statice* nearly allied to *S. macrophylla,* but perfectly distinct, and remarkable for its still larger leaves, which are petiolated. This species is not described in your 'Phytographia,' and I shall have at least the merit of enriching your future synopsis with three new *Statices.*

I could not discover in Fuerteventura the *Rhodorrhiza Hystrix,* Webb, MSS., brought from that island by Bourgeau, though I searched for it everywhere.

Returning to Teneriffe, I found everything burnt up around Santa Cruz, and I must go far off, and to higher districts, to seek plants in flower. I am thinking of the woods of Taganana. There exists, it is said, in the north, enfolded in the chain of Anaga, a certain wood, "un monte del tiempo de la Conquista," which foot of naturalist has never trod, and which I long to explore; but I am embarrassed as to my choice: one should be a Briareus, and with a multiple body, to collect everything and all here at the right time. I wish to penetrate the Cagnadas towards Guimar, and study the vegetation of the mountains of the south-west, and then the isle of Palma is there before my eyes, and waiting for me; one of those rare occasions too may occur of visiting Gomera and Hierro, without the walls of our world, and seductive from their very isolation.

I am now (August 22nd) at Orotava, and shall embark in a few

* *Tetrao (Pterocles arenaria),* and *Otis Houbara.*

† Name of Fuerteventura at the time of the Conquest. The inhabitants of this island are called Majoreros by the other Canarians.

days for Palma. Our excellent *savant*, Leopold de Buch, forbade me to return to Berlin without having visited the mighty *caldera*.

The climate at Orotava is far different from that of Santa Cruz. Here fogs are frequent, and heavy clouds hang over the forests, where no doubt the rain is falling. As I passed the high sloping plateau of the Rodeos, the cold was very sensible, and I was wetted to the skin. Thus it is, that in the upper regions the malady of the potatoes continues, but on the hot coast at Santa Cruz, in Fuerteventura, and Lancerotte, where indeed they were little cultivated, they are entirely free from this pest: it seems that heat and drought arrest its progress.

I have visited the garden of acclimatization, peopled at present not with plants, but with *souvenirs*. However there are still some very fine things, and nothing is irrevocably lost. The humble *medianero* (peasant), who presides over its destinies, has preserved a certain veneration for Flora and the Dryads. Yesterday I was invited to the garden of Don Francisco Ventoso, to see a rare and precious tree which no one in the country knew; the Duke of Saxe-Weimar and the Russian Prince Bragation, both amateurs of horticulture, had been confronted in vain with this vegetable enigma. Judge of my surprise when I recognized in this tree a magnificent *Jatropha Curcas!* In this garden I found a noble *Eucalyptus*, from New Holland. The *Statice arborea* is likewise cultivated here, but I am to be taken to-morrow to see better specimens of this fine *Siempreviva* on the roof of the Lazaretto near the port.

And now you may well inquire when I am to return to the Gorgades. Would that I could set out *instanter*. The voyage on board the great steamers is far more agreeable, and even shorter, than that from one of the Canaries to another in their dirty coasting vessels; but the climate of the Cape Verds, with which I am now thoroughly acquainted, is opposed to this. It would be as fruitless to botanize there now as at Paris in December. During the dry season all nature sleeps; then come the torrential rains of August and September, when no reasonable being quits his retreat for an instant. Even within, how could plants be dried where clothes, shoes, furniture, everything is covered with its appropriate mucor? Then too the reign of fever commences. Towards the end of October the "*estazaó das agoas*" is over, and when that time comes be certain that I shall mount the breach.

BOTANICAL INFORMATION.

The Linnæan Herbarium.

(*Continued from* vol. iv. p. 254.)

At p. 217 *et seq.* we gave the general remarks abridged from Dr. C. Hartmann's 'Notes on the Scandinavian Plants in the Herbarium of Linnæus,' translated by our valued friend Dr. Wallich from the Transactions of the Royal Swedish Academy of Sciences for 1849 (published 1851). Those are immediately followed by an enumeration with remarks by Dr. Hartmann on the Scandinavian plants of the Linnæan Herbarium which are esteemed dubious. Of the value of this enumeration, and of such remarks, made by so careful and so correct a Swedish botanist as Dr. C. Hartmann (now Professor Hartmann, having recently succeeded his respected parent in the Chair of Botany in the University of Upsal), to the British, and even to the European botanists, there can be no question, and we heartily wish it may encourage some botanists of our own country to offer similar remarks on the plants in the Linnæan Herbarium belonging to other regions.

1. *Scandinavian Plants of the Linnæan Herbarium, which are considered doubtful.*

Obs. The numbers which are here placed *before* the *generic* names indicate the number of each Genus in the herbarium. But the numbers which are placed *before* the *specific* names are not those of the herbarium, but are placed by me to indicate the order of the Swedish species and specimens contained under the same genus in the herbarium: hence also numbers of this kind, here omitted, will be found in another part of this enumeration. Lastly, the numbers here often given *after* the specific name, are added by Linnæus himself in the herbarium, and answer to the numbers of the species in the 'Species Plantarum, ed. 1.' (*C. Hartmann.*)

N.B. It will be observed that what follows in *Italics* is in manuscript in the Herbarium, written by Linnæus ("Linn."), Smith, or others, as indicated.

Monandria.

10. Salicornia.

1. *herbacea*, 1–*a*, *Gotland*. Linn. Smith has added *procumbens*, *Engl. Bot. t.* 2. *p.* 175.—Is a prostrate form of S. herbacea, Auct., common on the shores of Sweden.
2. *herbacea*, *Sp. c. d. s.?* Linn.—Is a form of the same species principally seen on the western shores of Sweden; nearly simple, erect, larger, with few, short, simple branches, well agreeing with S. herbacea, var. biennis, Fr. et Hartm.
3. *herbacea*, Linn.—Like the preceding, without number or locality. Appears to be the same larger and erect form, but with more erect, elongated, compound branches.

11. Hippuris.

1. *Hippuris*, 1. Linn., without specific name.—Is the most common form of H. vulgaris, Auct., with narrow leaves, 8 or more in a whorl. The specimen in the centre has the lower leaves elongated, two inches long; appears to be the fluviatile variety.
2. No name, and only *Leche*, Linn.—*tetraphylla*, *J. E. S.*, Smith.—Leaves 4 in a whorl, broadly lanceolate, is the maritime or tetraphyllous form of H. vulgaris.
3. Without name, and only *Pallas*, Linn. *Hipp. tetraphylla*, *J. E. S.*, Smith. In a strange hand, *Elatine an eadem cum Alsinastro? Kamtschatica*. As far as can be judged from the habit and the leaves and young fruit, this is the same as the preceding, or H. vulgaris, var. maritima. One specimen has 6, the rest 4, leaves in a whorl.

13. Callitriche.

1. Without name, and only number (1), Linn. Which number refers to the first species of this genus, C. palustris s. verna in Linn. Sp. Plant.—Of the specimens here placed together, some with elongated leaves (an inch long), linear, single-nerved, and emarginate, belong to C. autumnalis; others, with spathulate, obovate 3-nerved leaves, to C. verna, as these species are distinguished by Linnæus and most of the recent botanists. All are destitute of fruit.
2. *autumnalis* 2, Linn.—Two specimens, of which one is sterile, the other fructiferous. Seeds cruciate, without perigone; the leaves

of both linear, one-nerved, truncated or emarginate, the stem erect, branched, as well as the size and whole habit, show these specimens to belong to C. autumnalis.

3. *verna*, 1, Linn.—All the specimens, 2–3 inches long, fructiferous, with 2 petals, styles in part persistent, leaves opposite, 3-nerved, spathulate, uppermost ones rounded, belong to C. verna, of Linn. and recent authors.

4. *C. verna*, *β*. Linn.—Numerous specimens, which are fructiferous, an inch long, some erect, others creeping, all with a long filiform root; the leaves very short (a line long), linear, single-nerved (as far as can be judged from the dried specimens), the style partly persistent. Which characters, as well as the habit, which resemble that of Bulliarda aquatica, does not all answer to the description of Linnæus in Fl. Suec. and Species Plant.; but they agree better with C. verna, *β* minima, Wahl. Fl. Suec., and with C. verna, δ, Hartm. Fl. ed. 4.

Diandria.

26. Veronica.

1. *spuria, H. V.* 77. Linn. *V. spicata, angustifolia, C. B. Pin.* 246, Smith.—Is a form of V. spicata, of the western shores of Sweden, with numerous terminal and axillary elongated spikes, the leaves lanceolate, coarsely and obtusely serrated, opposite or ternate.

7. *hybrida*, 7. *Veronica, Flora Suec.*, (which, however, except the word *Veronica*, appears to be afterwards erased, and below is written) *figura in Ry.* Near one margin of the paper a station is added, *in insula Moclari Fläsklöian*, and near the other margin, 11. 1. 7—all written by Linn.—The authentic specimen from the locality above quoted, exactly corresponds with the description in Flora Suec., having the leaves of V. officinalis, with the habit and inflorescence of spicata. The plant is a foot high; the terminal spike lanceolate, thick, crowded, 4 inches long; the axillary spikes are short, on leafy peduncles; leaves of the peduncles lanceolate, nearly entire; superior cauline ones broadly lanceolate or oblong, lower ones petiolate, ovate, all subhirsute and crenate. In habit, therefore, by no means in inflorescence, it rather resembles officinalis, but in the spikes altogether spicata, of which two species, as the name implies; it is perhaps a hybrid, or a remarkable and

larger form of V. spicata with different leaves, rather than a form (of spicata), to which in Sweden at least the name of hybrida has been given, but which is in no way like the Linnæan plant. Of this latter only one specimen is known. It can hardly be considered a species.

9. *saxatilis*, written by an unknown and more recent hand; and on a label distinct from the paper by another hand, scarcely that of Linnæus, No. 2, Veronica fruticulosa. The plant is

10. *fruticulosa*, *Island*. Linn., *saxatilis*, J.E.S., Smith.—Without name, number, or locality; but attached to a paper which contains V. alpina are specimens which belong to saxatilis.

19. *agrestis* 21., Linn., by whom correction is made, for the name first written, *arvensis;* although the number 21, Sp. Pl. ed. 1. refers to the latter, not to the former species.—The characters indeed quite accord with No. 20, agrestis, Sp. Pl. and Fl. Suec., but they belong to that form which is never distinguished by the name of polita, as indicated by the large, ovato-lanceolate, nerved acute calycine segments, the shining nearly glabrous ovato-oblong leaves, and the habit of the plant.

21. *hederifolia vera*, Smith. No remark by Linnæus.—It is the V. hederifolia, Linn. Fl. Suec. (where the "leaflets of the calyx" are said to be "cordate") and of recent Swedish authors; and is remarkable for the leaves being rounded from a cordate base, 3–5-lobed, and the segments of the calyx being triangular-cordate acuminated and ciliated.

22. *hederifolia* 22. Linn., and by Smith is added β (although in Spec. Plant. ed. 1. *a* only, not β of this species, is so). From the preceding species (21) the present is distinguished by its whole appearance and by the following characters: the segments of the calyx are obovate or elliptical, obtuse, the stem is thicker, more erect, the leaves are approximate, cuneate at the base, or decurrent into the petiole; all which marks do not well tally with V. hederifolia, Spec. Plant., and Fl. Suec., but quite accord with V. persica, or Buxbaumii of modern authors.

26. *peregrina*, Linnæus, as well as locality; H. U.—The specimen is no way different from the one which precedes it in the herbarium, V. romana, to which Smith also has written "*peregrina eadem est.*" Both the specimens however agree, not with V. pe-

regrina, but rather with V. acinifolia, Sp. Pl., since the leaves of both are elongated or ligulate and crenulated (not "entire"). In like manner the specimen on the following paper, called V. acinifolia, is without doubt to be referred to V. peregrina, of which it has all the characters, even the entire leaves. That a change has been made in this place appears from this, that to the specimen cited, called V. acinifolia, No. 26, is written by Linnæus, which, in Sp. Pl. ed. 1, is the number of V. peregrina. In the same mind, Smith, after the name V. acinifolia, has added, "certe non est; V. peregrina est," J. E. S. Hence though it is easily to be seen that peregrina of the herbarium is acinifolia, and that acinifolia of the herbarium is true peregrina, yet in no way can we ascertain, since no locality is given from the herbarium, whether peregrina has ever really been found within the Swedish limits.

33. PINGUICULA.

Among species of this genus preserved in the herbarium (concerning which see Part II.), there is no specimen of that showy form called P. vulgaris, β, of which Linnæus makes mention in the 'Flora Lapponica.'

(*To be continued.*)

Double Cocoa-nut (Lodoicea Seychellarum).

All lovers of Palms will be interested to learn that the Royal Gardens of Kew have just received a valuable addition to their collection, in the safe arrival of a healthy young plant of the famous *Coco de Mer*, or *Double Seychelles Cocoa-nut*, the first ever imported alive to Europe. For this we are indebted to Professor Bojer of the Mauritius; and, for its safe and speedy conveyance to this country, to Messrs. Blyth and Greene and the Directors of the new screw-propelled steamers, who, in the most generous manner, on hearing what was expected to come from the Mauritius to the Royal Gardens of Kew, volunteered to give the cask with the plant (together weighing 10 cwt.) a free passage in the "Queen of the South," and every care to be taken of it. In two months from the date of the vessel sailing from the Mauritius, the plant was safely landed in England. There was a vigorous leaf

four feet and a half long when the plant came away; and a remarkable healthy new leaf made its appearance during the voyage, which is now 1½ foot long.

NOTICES OF BOOKS.

Folia Orchidacea; *by* Dr. Lindley.

The '*Folia Orchidacea*,' or an "Enumeration of the known species of Orchids," is a contemplated work, to the task of which—we say it in all sincerity—we believe there is only one author existing who is competent; and that author is Professor Lindley. His devoted attention to this family of plants, his unprecedented advantages, due to his familiarity with the living plants now so long in cultivation in public and private gardens, and the noble collection in his herbarium,—for all Orchid-growers and collectors have been anxious to cast their specimens at his feet,—the numerous figures that he has published, or been instrumental in publishing, and above all the innumerable graphic illustrations on the papers of his herbarium, made from living and dried specimens, executed, too, by his own hand,—all give him an advantage which no other individual has possessed or can possess. His '*Folia Orchidacea*' has been some time announced, and we have the pleasure of stating that the first part is now before us. "The work," the author tells us, "upon which this enumeration is founded (*Genera et Species Orchidearum*) was commenced in April, 1830, and terminated in October, 1840;" and that work, all know, was a great boon to botanists and to Orchid-growers. "Twenty-two years have therefore elapsed since its commencement, during which period the advance of discovery has been so rapid, that numerous genera have been added to what were then known; others have been subdivided, or wholly remodelled; and multitudes of species have been introduced, and published in so many different works, that their identification has become attended with very great difficulty. In 1830 the Orchidaceous plants of tropical America were scarcely known in either gardens or herbaria; of late years they have multiplied enormously; those of the Philippines were unheard of;

and the numerous Japan species were only puzzles which none but the Dutch had the means of unravelling. At the present day, we have actually *in cultivation* a greater number of Orchids than were known in 1830 from books and herbaria taken together! As an example, the genus *Masdevallia* may be mentioned; in 1833 supposed to consist of only three species, and to belong to the section called *Vandeæ*, it is now known to include between thirty and forty species, and to be a new Malaxaceous genus, nearly related to *Pleurothallis*."

There are however certain genera respecting which the author has yet very insufficient information: instead then of giving the genera of this work in systematic arrangement, as in the 'Genera et Species' already published, the genera most completely known to him will be treated of first, each genus published separately, and paged separately; so that "at the completion of the work they can be all arranged according to whatever method further experience and accumulated information shall show to be most expedient."

The genera described in the first part are *Stanhopea*, 20 species; *Coryanthes*, 4 species; *Ionopsis*, 9 species; *Quecketia*, 1 species; *Zygastates*, 2 species; *Odontoglossum*, 66 species; and *Didactyle*, n. genus, separated from *Bolbophyllum*, 7 species.

Corda, A. C. J.: *Flore Illustrée de Mucédinées d'Europe.* 1 vol. folio, with 25 Coloured Plates. Leipzig, 1840.

Although published twelve years ago, it has not been our good fortune to see this beautiful work, and one so highly creditable to the lamented author, till now, and we hasten to make brief mention of it; for we doubt if any microscopic vegetation was ever more admirably illustrated than on the present occasion, or if ever the microscope has brought to light more extraordinary forms and structures than are here portrayed, and, we cannot doubt, from the well-known character of the author, with great fidelity. Plants which if taken separately could not be visible to the naked eye, and which collectively only exhibit small discoloured spots on dead animal or vegetable substances, are, under the former condition, magnified to a span or almost a foot in length. A folio plate is given to each or at most to two species, and

each description occupies from two to four folio pages.—"Depuis quinze ans," says M. Corda, in the Preface, "nous sommes occupés des belles formations qui distinguent les champignons; ce furent surtout les Coniomycètes et les Mucédinées qui captivèrent notre attention et concentrèrent tous nos efforts. Analyser ces apparitions merveilleuses à l'aide d'excellents microscopes, voilà ce qui compta longtemps parmi nos plus vives jouissances. Nous déposons donc dans ces feuilles la description d'une suite coordonnée d'individus appartenants à cette création de merveilles, invisibles à l'œil nu, que nul pressentiment n'avait encore révélé à l'esprit; d'une création de la mort, née de la pourriture, matière chaotique, pour ainsi dire, d'êtres anéantis, transformée en individus éthérés, qui sont aux yeux scutateurs du natraliste à intelligence active et profonde les précurseurs de types d'un monde végétal supérieur."—There are twenty-five genera and twenty-six species described and figured.

DR. WIGHT'S *Icones Plantarum Indiæ Orientalis.*

We have, more than once, noticed with no small commendation this work in our Journal; and the *Orchidaceous* portion hitherto published at p. 252 of the third volume of the present series, and more fully at pp. 190, 191, of our present volume, when 139 plates were devoted to excellent representations, with dissections, of the Indian species of this family. Another portion of *Orchidaceæ* similar to this in extent (and we are sure in value too) is now on its way to England; and a third portion, consisting of 160 or 170 plates, is nearly ready, 100 of them being already executed; in all between 400 and 500 plates will be given illustrative of this Natural Order alone. Previous to Dr. Wight's return to Europe in the spring of 1852, this incomparable botanical work, with upwards of 200 plates, will be brought to a conclusion with, we believe, the sixth volume, and will include a monograph (with figures) of the Indian species of the genus *Pouzolzia* (in *Urticeæ*), raising the number of species, from the 15 or 18 hitherto known, to about 55. In England we have reason to know that our learned and indefatigable friend will devote his time and his energies to the concluding volume of his 'Prodromus Floræ Peninsulæ Indiæ Orientalis.'

On the Bleached Wood of the Arctic Voyagers, as a possible indication of the route of Captain Sir John Franklin; *by the* Rev. M. J. Berkeley.

(Plate III.)

During the course of the voyage of Captain Penny in the "Lady Franklin," in search of the missing crews of the Erebus and Terror, two pieces of drift-wood were picked up, which, from their possible connection with the object of their search, excited considerable interest. One of these, found in Robert Bay, of Baillie Hamilton's Island, lat. 76° 2′ north, long. 96° west, was evidently a piece of wrought wood which had been used in the construction of some ship; and as it was found in the supposed course of the ships at Wellington Channel, and was bleached, and had traces of vegetation upon it, it was desirable to obtain information as to the probable time which it would take to produce the appearance presented by the piece of board, as also with regard to the precise nature of the vegetation. The other piece was found in Disappointment Bay on the north side of Cornwallis Island, in lat. 75° 36′ north, and long. 96° west, by Mr. Goodsir. This was evidently a piece of drift-wood, and probably of White Spruce, which had been used for fire-wood; and as there are no natives in that quarter, nor any recent traces, it is most probable that this really had some connection with Franklin's expedition.

The former piece only was submitted to my inspection in the first instance, and, as an immediate reply was necessary, and I had scarcely two hours at my disposal, I was not able to enter into such investigations as the interest of the subject demanded. My note however, imperfect as it is, is alluded to in Sir John Richardson's report published amongst the Admiralty papers on the subject, and the sketches which accompanied it, though very rough and hasty, were considered of sufficient interest to be reproduced. Sir John Richardson's paper is given at length in the Appendix to Dr. Sutherland's account of Captain Penny's voyage, together with an extract from my note of October 12, 1851, and woodcuts illustrative of my observations.

I did not, however, feel content with leaving the matter as it stood at the time the report was delivered to the Admiralty, and therefore, on the reception of the second piece of wood from Sir John Richardson, together with other materials bearing on the subject, I examined as ac-

curately as I was able the effects of weather on exposed timber in this climate. The result of these observations is now submitted to the public, as unhappily the interest connected with it is by no means extinct, and the botanical matter in connection with it is not without a certain degree of value.

Everything, indeed, connected with Sir J. Franklin's expedition is of such deep and universal interest, and the remotest chance of obtaining any information so eagerly seized, that the occurrence of a few black specks on two pieces of drift-wood has assumed an importance apparently incommensurate with the subject. It was obviously necessary to do something more than to give a generic and specific name to the minute vegetation existing amongst the bleached fibres, and it was therefore rather mortifying to deliver in an opinion on a matter of some importance, without an opportunity of examining the matter properly*. I was much rejoiced therefore when, by the kindness of Sir John Richardson, I had an opportunity of examining the whole of the piece of Elm and the fragment of White Spruce picked up by Captain Penny; and with the help of other materials entrusted to me, and what I have had myself occasion to collect, I have at least been able to ascertain the real character of the Cryptogams on the two pieces of wood in question, and indeed, as regards one, I have found the very species on planks recently exposed in this country.

The circumstances of climate are so totally different, and the long winter so unfavourable even to partial decomposition, that it is quite impossible to form any judgement, from what takes place in England, of the probable effects of the extreme changes incident to such high latitudes. It may not however be uninteresting to make a few remarks on the bleaching of wood as it takes place here. My observations have necessarily been confined to my own immediate neighbourhood, and relate merely to the kinds of wood in common use for fences, such as Oak, Ash, Maple, Lombardy Poplar, Elm, and Sallow. Foreign Deal is not used at all for the purpose, and I have had one opportunity only of examining boards furnished by Larch and some other Conifer, cer-

* On a hasty examination I had stated that the production of the Elm plank exhibited a structure intermediate between that of Lichens and Fungi, in which report Mr. Churchill Babington exactly agreed with me; but better opportunities of examination and comparison show that the perithecia are extremely thin, with a thinner base, and not at all different from those of other allied Fungi, so that all doubt as to affinity is removed.

tainly either Pine or Spruce, the Larch employed in small quantities consisting principally of young trees split lengthwise. I have been quite surprised to find how very soon the weather acts upon fabricated wood when fully exposed to sun and rain. Specimens of Oak which had been roughly cut out only three months since are in parts as much bleached as if they had been subjected to the wash of gravel for as many years; and the same may be said of the other kinds of wood mentioned above, especially Larch, the dates of their fabrication varying from three to fifteen months. In all these cases vegetation, with a single exception, closely allied to that on Captain Penny's piece of English Elm, is very evident, and in a greater or less degree of perfection according to the more or less recent fabrication of the materials. In these instances however an agency has existed, which would not at first have been suspected. After a careful examination of all the most marked cases of bleaching of the woody fibres, I have satisfied myself that the external structure has been deranged, and more fully subjected to the bleaching influence of sun and air, by wasps and other insects; and this indeed accounts for the very rapid change of colour which has taken place even in the hardest woods, for where the surface remains much in the same condition in which it was left by the saw, the fibres are in general but slightly bleached, except in the softer woods.

In all the cases where insects have been at work on sound wood, fungi have established themselves on the bleached fibres. How far they have co-operated it is difficult to say, but not only are the fine threads of their mycelium to be found creeping over and between the constituent cells, but the cells themselves are frequently gorged with the mycelium, which must have lived at their expense and exercised a very powerful influence in their disorganization. And this I find to be the case in all bleached wood, whether the bleaching has taken place from pure circumstances of climate, as in the Arctic piece of Elm, or in planks exposed here in the early portion of the year, when there could be no other agent of the disintegration of their surface than atmospheric conditions, or in others fabricated in summer, which have been abraded by insects for the structure of their nests.

Besides this general bleaching, which, according to circumstances, takes places more or less rapidly, there is a partial bleaching, which every one must have observed. It is almost impossible to find a rail which has been exposed for any length of time without observing more

or less defined white patches, which more easily catch the eye because the other portions of the surface are generally occupied by Cryptogamous vegetation, often of a dark tint. I have taken great pains to ascertain the origin of these, but have not always been able to satisfy myself about it; they arise, I think, at least from two distinct causes. Many are certainly nothing more than patches where the surface has been gnawed off by insects, and in all these cases the texture is much decomposed, and but few perfect Cryptogams exist upon them, though the broken bases of minute perithecia, destitute of everything like fructification, are generally visible. But even in these patches different portions of the surface are not in the same condition. In one part the fibres, when exposed freely to moisture, retain it like a sponge, and have, in consequence, an hygrophanous appearance like that of many Agarics when wet, while the others retain their opake aspect, whatever quantity of moisture is applied. The fibres in the latter case are certainly more decomposed, but not to such an extent as to exhibit any different aspect under treatment with chemical tests. But there is another mode in which such spots arise. In planks recently exposed paler patches are often visible, simply from the fact that such spots have not been attacked by any mycelium. There is probably some difference of chemical condition in these patches, which has not been favourable to the immediate growth of Cryptogamic vegetation. A rough plank of Lombardy Poplar, perfectly free from vegetation when placed in a fence last July, has afforded me the means of studying this matter. The whole surface is mottled with patches of very pale olive when the surface is moist, the olive-tint being due to the mycelium of the very Fungus which now exists upon the Arctic Elm. I do not find any Fungus upon the whiter portions at present, but the process of bleaching is evidently advancing rapidly, though not perhaps so surely as in those which are now slightly discoloured from the presence of mycelium.

In process of time the whole surface of the rail, if the situation is sufficiently damp, is occupied by Algæ and Fungi, and it is then, I believe, that the more conspicuous white spots are formed by the abrasion of the previously decomposed tissue. Other Fungi are produced occasionally on such spots, but I do not find in general any second growth of Fungi belonging to that peculiar group which first establish themselves on the exposed surface of the wood. A large number of species appear to grow in more northern countries, such as Sweden, on bleached

wood, as *Agyrium rufum, A. atro-virens, Sphæronema colliculosum,* etc.; but whether the bleaching is caused by the Fungi, or whether they grow on wood already bleached, I am unable to say, as the kinds in question are not found in our lower latitudes. As far as I can judge from specimens, I am inclined to think that different species grow under very different conditions of the wood.

In such as are before me I perceive the same difference in the degree of bleaching in the same spot, which I have before alluded to without being able to throw any light upon the subject. I had hoped by means of chemical agents to detect some difference of chemical condition, but have failed to do so. In all cases of bleached fibre, where decomposition has not actually attacked the primitive walls of the cells, which consist of matter insoluble in water, the application of iodine and sulphuric acid gives a more or less decided tinge of violet, and where the wood has been exposed to the wash of salt water, the tint assumed is much darker. In woody fibre reduced to the state commonly known under the name of touchwood, it is well known that the walls do not remain in the state of cellulose, but approximate in their characters to bassorin; the fibres in that condition are however no longer in the state to which the term *bleached* can properly be applied. In the case of surfaces where the subjacent wood is not affected, it is clear that the rain will constantly wash off the more tender or disintegrated portions, and the whited walls which still remain will therefore, to a greater or less degree, exhibit much the same chemical conditions as ordinary bleached fibre.

There is a circumstance about the piece of Arctic Elm which has somewhat puzzled me. It exhibits three kinds of surface,—one which has been planed and painted with pitch or some similar material, one merely roughly sawed, and the split surface. On the smooth side little change comparatively has taken place; the fibres of the split surface are completely bleached, and many of them full of mycelium, but in other respects in the ordinary condition of such tissue in Elm; but on the sawed surface, where the ends of the fibres form a sort of velvety pile, the cells exhibit in various parts swellings of different kinds, as represented in the subjoined figure,—appearances which I have not been able to find in other parts of the wood, or in Elm or other wood which has been exposed to bleaching here (with the exception only of Larch), whether simply from weather, from the attacks of insects, or from the

abrasion of gravel, as in several specimens which have been exposed to such abrasion from one to forty years.

It is time however to make such especial observations as occur to me respecting the two pieces of wood brought home by Captain Penny. One thing at least appears tolerably certain, now the nature of the vegetation on the Elm is ascertained, that whatever length of time it may have taken to bleach the surface to the extent to which it is now bleached, the vegetation on it was that of the summer in which it was found. From observations on that and similar productions here, they appear to be Fungi of but short duration, at least in such a state of perfection as that in which they appear in point of fructification on the Arctic wood. It is very possible that for a certain limited time a fresh succession of specimens might arise, but those on the Arctic wood are all evidently in the same stage of growth, and it is scarcely probable that they can have retained through the temperature of an Arctic winter their delicate naked spores in a state of perfection. It is possible, indeed, that on a surface annually abraded a new crop of the same Fungus might spring up every year; but this would not apply to the split surface, on which the Fungi are in the same condition as on the other surface. A single perithecium of a different species was found in a crack, but little is to be concluded from this, as the crack might take place at very uncertain periods of time. In the same crack I also found the same species as that which occupies the bleached fibres; and it is worthy of remark, that in Oak piles exposed to weather on the coast for forty years, as observed by Sir J. Richardson, young immature *Sphæriæ*, with their nucleus still in a Sclerotioid state and quite devoid of asci and sporidia, are plentifully produced on the fissured surface. On the whole then, as far as the evidence of the Cryptogamic growth affects the question as to the time of exposure of the plank, it is certainly, as far as judgement may be formed from such growth in our latitude, in favour of a recent exposure; but this evidence is to be counterbalanced by the experience of those who have had an opportunity of observing the very slow effect of climate on wood exposed in those countries*.

And this is strongly confirmed by the other piece of wood mentioned

* See that part of the Report relative to the blade of an oar now at the Admiralty, which had been drifting since 1833, the last time the whaler whose name it bears was in Baffin's Bay. Among other articles left behind by Sir John Franklin's party

in the Report, whose date is pretty well ascertained. It appears to me quite clear that this was a piece of drift-wood bleached before it was exposed to the fire. It precisely resembles drift-wood from Fort Confidence, and has suffered very little change since it was burnt, most probably in 1845 or 1846. And, what is very curious, I find upon it certain traces of precisely the same Fungus which exists in considerable quantity on the Fort Confidence wood. On a microscopic examination of the bleached surface I detected a few deeply seated minute black specks, which exhibit, though in most minute quantities, undoubtedly the same *Sporidesmium* as exists on the drift-wood. The species is so near to the common *Lepraria nigra*, which must be referred to the genus *Sporidesmium* as at present constituted, that I scarcely think it distinct, the only difference consisting in the constituent cells of the spores being more opake and slightly smaller. *Sporidesmium Lepraria* is one of those Fungi which last for years on the same matrix, and which leave traces for a long time, even when the surrounding tissues are worn away, and I have frequently seen on old wood our English form of the species, precisely in the same state in which the Arctic form exists on the drift-wood. I do not think therefore that the specks have been formed since 1845–46, but that they are the remains of the species which existed on the drift-wood when used for fuel by some members of Sir John Franklin's expedition, exactly as it now appears on the drift-wood from Fort Confidence. In closing these remarks it is no little satisfaction to me to find these minute objects bear unexpectedly on a subject of such interest and importance, as it is one amongst many other proofs that the meanest natural productions are, even on the *cui bono* principle, not unworthy of close investigation.

It remains only to give the characters of the species which have come under investigation, which might have been multiplied to a great extent had more time and better opportunity offered. The object however is simply to show the real nature of the bodies which appear on the Arctic wood, without any view to mere botanical specification.

There is not the slightest pretence that any of the productions which I am about to describe belong to Lichens even of the lowest type.

on Beechey Island is a kind of rake, employed probably to drag seaweed on shore. The shaft is of fir, and is not bleached except a part near its head, where from friction against the stones the constituent fibres were disentangled. (*Sir J. Richardson, in litt.*)

There is not a trace of crust, and the whole structure is that of the more obscure hypoxylous Fungi. I do not therefore consider myself called upon to settle the affinities of similar anomalous bodies included by authors amongst Lichens, and I am the more willing to escape the task as I have not sufficient materials for anything decisive. Without analysis it is quite impossible to come to any satisfactory conclusion.

1. *Phoma inophila*, n. s.; maculis indeterminatis sericeo-nitentibus; peritheciis oblongis; sporis oblongis minutissimis. (TAB. III. f. 4.)

HAB. On planks of Maple. King's Cliff. Nov. 1851.

Forming white shining patches, which contrast strongly with the rest of the surface. Perithecia oblong. Spores extremely minute, $\frac{1}{16000}$ of an inch long, oblong, with a nucleus at either extremity.

The spores of this species are so small that they are only just distinguishable with a power of 250 diameters. I do not know whether the peculiar aspect of the patches is due to the fungus, but it seems to be characteristic.

A form which I cannot distinguish grows on Elm.

It is to be observed that the measurement of the spores is to be considered as that of average individuals. Some occur varying very greatly from the typical size; such variations however will not affect the general correctness of the measurements.

2. *Phoma mucifera*, n. s.; peritheciis sparsis oblongis; sporis minutissimis muco involutis. (TAB. III. f. 5.)

HAB. On Elm planks. King's Cliff. Nov. 1851.

Perithecia scattered, oblong, discharging the spores from the base when ruptured in a cirrhiform string. Spores extremely minute, oblong, with a nucleus at either extremity.

The mucous substance in which the spores are involved is so little soluble that they are not dispersed as in other species. This cannot be placed in *Sphæronema*, because the spores are not discharged by an apical pore. Further observations may possibly justify its generic separation.

3. *Phoma ulmicola*, n. s.; maculis fuscis; peritheciis subcongestis; sporis minoribus ellipticis hyalinis. (TAB. III. f. 3.)

HAB. On Elm planks exposed to the weather. King's Cliff. Nov. 1851.

Forming little oblong brown patches. Perithecia rather crowded.

Spores minute, hyaline, elliptic, $\frac{1}{12000}$ of an inch long. Nuclei obsolete.

This has larger spores than *P. inophila*, and their outline is elliptic and not oblong. Besides this and the foregoing species, I find in the cracks, on the medullary rays, what I take to be *Coniothyrium glomeratum*, Corda.

4. *Phoma epileuca*, n. s.; maculis indeterminatis; peritheciis elongatis; sporis hyalinis majoribus oblongis enucleatis.

HAB. On bleached Pine planks. Woodnewton. Dec. 1851.

Perithecia black, minute, elongated, following the direction of the fibres. Spores perfectly colourless, oblong, $\frac{1}{6500}$ of an inch long, sometimes slightly broader at one extremity, without any definite nuclei.

Distinguished from *P. fibricola* by its hyaline spores.

5. *Phoma fibricola*, n. s.; maculis indeterminatis; peritheciis minutis elongatis; sporis ovatis ellipticisque viridulis.

HAB. On planks of Ash and Oak and Elm, amongst the bleached fibres. King's Cliff. Nov. 1851.

Perithecia mostly scattered, but sometimes forming distinct groups, elongated, following the course of the fibres. Spores ovate or subelliptic, larger than in most species, $\frac{1}{4200}$ of an inch long, of a delicate olive-green, without any distinct nuclei.

The spores in the specimens on Ash, of which the measure is given above, are rather larger than in those on Oak, but there is no other difference. This is not a true *Phoma* according to M. Desmazières' definition of the genus, which I am however inclined to think too restricted, and which indeed does not tally with all his published species.

6. *Phoma bicuspidata*, n. s.; maculis indeterminatis; peritheciis elongatis; sporis majoribus utrinque apiculatis hyalinis binucleatis.

HAB. On Pine-wood. Woodnewton. Dec. 1851.

Perithecia elongated, black, minute, following the direction of the fibres, at first scattered, at length often confluent. Spores $\frac{1}{3500}$ of an inch long, shortly fusiform, apiculate at either end, variable in size and in the degree of acumination, hyaline, containing two nuclei; seated on slender sporophores.

This is at first a very evident *Phoma*, with a distinctly cellular perithecium. At length the perithecia are often confluent and confused with a minute *Tubercularia*, and the production in consequence appears

very anomalous. The spores are peculiar in their form and very distinct from those of other species.

1. *Diplodia fibricola*, n. s.; maculis pallidis obsoletisque; peritheciis minutis elongatis; sporis minoribus ellipticis centro subconstrictis.

Hab. On bleached wood amongst the fibres; on an Elm plank; lat. 76° 2′, long. 96°; July 5, 1851. On Lombardy Poplar; King's Cliff; Nov. 1851.

Perithecia minute, more or less elongated, following the course of the bleached fibres, rather delicate, easily lacerated, either scattered or disposed in distinct patches, sending off a few fibres from their base. Spores minute, $\frac{1}{4000}$ of an inch long, subelliptic, generally slightly constricted in the centre, pale yellow-brown, uniseptate, or very rarely acquiring a second septum. The septum goes quite through the outer membrane.

The perithecia are quite mature in the Arctic specimens, and consequently the attachment of the spores has not been ascertained. In the English specimens I have in one or two instances seen what I believe to be articulated sporophores bearing one or two spores; but this requires confirmation. The spores are far smaller than in most *Diplodiæ*.

I have given a figure of a single perithecium found in a crack of the Arctic piece of Elm, together with the sporidia of some Lichen. It belongs to the genus *Phoma*, but differs from other species in its cracked surface. I forbear assigning it a name, as it seems absurd to propose a species in so obscure a genus from a single perithecium.

2. *Diplodia öospora*, n. s.; maculis olivaceis; peritheciis minutis elongatis; sporis minoribus obovatis fuscis.

Hab. On bleached wood of some species of *Salix*, belonging to the section of Sallows. King's Cliff. Nov. 1851.

Patches oblong, olive-brown, from the fibres of the mycelium. Perithecia minute, elongated. Spores minute, obovate, yellow-brown, uniseptate, $\frac{1}{3200}$ of an inch long, $\frac{1}{4000}$ broad, much darker than in *D. fibricola*.

This differs from the foregoing in its dark patches, but more especially in its differently shaped, larger, and darker spores, which I have seen attached in one or two instances so as to show that they are really obovate.

If further observation should prove that these species really have their sporophores more developed than in normal *Diplodiæ*, they will

form a distinct section in the genus leading to *Cystotricha*, which they much resemble in habit, though it does not appear that they open longitudinally.

Hendersonia fibriseda; peritheciis subglobosis minutis tenerrimis atro-cæruleis; sporis elongatis flexuosis utrinque obtusis.

HAB. On Birch planks. King's Cliff. Dec. 1851.

Perithecia punctiform, subglobose, seated on definite white spots, following the direction of the fibres. Very delicate pale blackish-blue, especially at the edge, which consists of interwoven fibres. Sporophores short, obtuse; spores $\frac{1}{666}$ of an inch long, $\frac{1}{5328}$ broad, containing obscurely defined nuclei.

This is a *Hendersonia* according to M. Desmazières' view of the genus, agreeing in structure with such species as *H. Typhacearum*. The white spots on which it occurs are more decayed than ordinary bleached surfaces.

Sporidesmium Lepraria; maculis effusis aterrimis; sporis irregularibus basi nulla distincta suffultis. *Lepraria nigra*, Eng. Bot.! t. 2409.

Extremely common on planks of wood exposed to the weather, on which it forms broad black persistent patches. Sometimes however it occurs in distinct black specks, which wear the appearance of little oblong perithecia of various species so common in such situations. The spores are extremely irregular, of no definite shape, and without any distinct base.

The Arctic specimens differ only in their darker colour, and slightly smaller cells. This may be called var. *nigerrima*. I am indebted to Mr. Borrer for authentic specimens of *Lepraria nigra*, Eng. Bot., from whom also I have *Spiloma microscopicum*, Eng. Bot., which appears to be a mere variety of the same species.

In *S. polymorphum*, Corda, there is a distinct articulated peduncle, and in *S. antiquum* the spores are erect and elongated; *S. melanopum* has the same habit, but there is a distinct cellular base to the spores.

Sphæria (Platystomæ) *fibritecta*, n. s.; sparsa obtecta; peritheciis depressis; ostiolo obsoleto vel subcompresso vario; sporidiis curvulis quinqueseptatis.

HAB. On bleached fibres of Larch planks. King's Cliff. Dec. 1851.

Scattered, minute, black, often slightly elongated, depressed; ostiolum sometimes quite obsolete, but frequently present, and varying from punctiform to linear. Asci clavate, varying greatly in length,

paraphyses slender. Sporidia curved, subfusiform, yellow-brown, quinqueseptate, about $\frac{1}{650}$ of an inch long.

The perithecia are rather larger than those of the other Fungi commonly present in similar situations. The contents are white. Another species, with cellular sporidia and salmon-coloured jelly, occurred on the same wood, but in extremely small quantities. Nothing can be more variable than the ostiola of the species I have described. Even in extreme cases it is entitled only to a place amongst the *Platystomæ* from affinity rather than well-defined characters.

Explanation of the Figures.

(Tab. III.)

Fig. 1. Spores of *Phoma fibricola.* *a.* On ash. *b.* On Oak.

The spores in this and the other species figured are drawn on a scale as seen with a magnifying power of 250 diameters, except where it is expressly said that they are more highly magnified.

Fig. 2. Spores of *Phoma epileuca.*

Fig. 3. Spores of *Phoma ulmicola.*

Fig. 4. *a.* Spore of *Phoma inophila.* *b.* The same, more highly magnified.

Fig. 5. *a.* Perithecium of *Phoma mucifera*, sending out a tendril of mucous matter filled with spores, when placed in a drop of water on the field of the microscope. *b.* Spores of the same. *c.* Spores more highly magnified.

Fig. 6. *a.* Spores of *Phoma bicuspidata.* *b.* The same, with sporophores highly magnified.

Fig. 7. *a.* Perithecium from a fissure in the Arctic Elm plank. *b.* Spores of the same. The spores of this have not been measured with the micrometer.

Fig. 8. A sporidium of some Lichen found in the same fissure.

Fig. 9. Spores of *Sporidesmium Lepraria*, var. *nigerrima.*

Fig. 10. *Hendersonia fibriseda.* *a.* Portion of edge of perithecium. *b.* Spores seated on their sporophores.

Fig. 11. *Diplodia öospora.* *a.* Spores on their Sporophores. *b.* The same more highly magnified.

Fig. 12. *Diplodia fibricola.* *a.* Spores. *b.* The same, more highly magnified. *c.* The same, from sketch by Mr. Broome. *d.* Perithecium seated on the fibres of the wood and medullary rays, which

either contain or are traversed by mycelium. *e.* Portion of perithecium, showing the external wall and more delicate base.

Fig. 13. *a.* Woody fibres containing mycelium, from the split surface of the piece of Arctic Elm. *b.* Distorted fibres from the sawed surface. *c.* A portion of a fibre from the same surface, filled with mycelium.

Fig. 14. *Sphæria fibritecta.* *a.* Perithecia more or less exposed. *b.* Asci and sporidia. *c.* Sporidia drawn to the same scale as mentioned above.

CENTRALAMERIKAS RUBIACEÆ, etc. (RUBIACEÆ *of Central America.*) By A. S. OERSTED. Communicated the 12th May, 1852*. Translated from the Danish, by Dr. WALLICH, V.P. Royal and Linn. Soc.

The family of *Rubiaceæ*, which in temperate zones consists of only small and unattractive herbs, mostly weeds, performs a very important *rôle* between the tropics, on account of its extent of species, amounting frequently to one-thirtieth of all the Phanerogams; the number and magnitude of each species, many of these being large trees, and forming a principal feature of forests; and lastly their utility, various members of the family contributing essentially to the wealth of the countries which they inhabit, f. i. Coffee, Peruvian bark, and Ipecacuanha. This observation applies in full to the *Rubiaceæ* of Central America, notwithstanding only a limited number of their species is known, owing to our imperfect knowledge generally of its flora. Although several botanists and collectors have visited this part of America, their sojourn there has either been very transitory, or they have paid no particular attention to those localities which are especially productive of characteristic and striking vegetable forms. Until very recently the entire eastern slope of the country, covered with one immense primeval forest, has remained in that as well as in all other respects, a *terra incognita.* The Bohemian *Thaddæus Hænke*, whom the Spanish Government sent in 1789 to accompany Malespina on his celebrated expedition to America, but missing him, made journeys on his own account, was the first botanist, as near as is known, who examined Central America, namely Panama (Reliquiæ Hænkeanæ, 1826–1835). *Bertoloni* has described a small number of plants from the northern Central America (Florula Guatemalensis);

* The Association of Natural History at Copenhagen is here meant.—TRANSL.

which part was likewise examined by *Theodor Hartweg*, sent out in 1836 as plant-collector for the Horticultural Society of London (Plantæ Hartwegianæ, auct. G. Bentham). The Austrian botanist *Friederichsthal* performed journeys through a great part of Nicaragua and Costa-Rica in 1839, and appears to have made great collections of plants; but as these are not further mentioned anywhere, it may be presumed that they must have perished. The largest harvest hitherto made known from Central America, are due to Drs. Hinds and Sinclair, and to Barclay; the two former accompanied the British man-of-war Sulphur, as surgeons and naturalists, on the expedition to the South Sea, under Captain Belcher, the last as collector for the Royal Botanic Garden at Kew. The plants, chiefly collected at Panama, Nicoya and Realejo, have been published by *G. Bentham* (The Botany of the Voyage of H.M.S. Sulphur, 1844). The Prussian *I. v. Warszewics* arrived in Central America in 1844 on purpose to establish a botanic garden in the Belgian colony of St. Thomas, on the east coast of Guatemala; but as that colony ceased to exist after the lapse of one year, he travelled through the greatest part of the country from Guatemala to Panama, principally to collect *Orchideæ* and other ornamental plants. Besides a great harvest of these, to which the garden catalogues of late years bear witness, he gathered valuable collections of dried specimens, which are presered in the Royal Herbarium at Schoeneberg near Berlin. Only few species of these have been described; which is the case,also in regard to collections very lately brought home from Veragua by *Mr. Seemann*, who accompanied the British man-of-war Herald on the expedition to the South Sea. A brief account of his voyage is contained in Hooker's Journal of Botany, vol. iii. for 1851. Some plants collected by *Dr. Duchassaing*, medical practitioner at Panama, have been described by *Walpers* in Linnæa, vol. xxiii. The whole series of *Rubiaceæ* thus brought to light, scarcely exceed thirty in number. The following result will show that, as compared to this amount, a not inconsiderable increase in the family has accrued from my voyage; and yet we are hardly warranted in assuming that the whole number forms more than one-half, or perhaps one-third, of the species found in Central America; for the botanical treasures of the country are quite unknown, especially as regards the species of our family which have in general a very confined locality. That part which I had an opportunity of examining, from June 1846 to March 1842,

is situated between long. 10° and 13° N. I ascended the river San Juan, which entirely divides the eastern primitive forests, where the country is wholly unpeopled, or haunted only by wild tribes of aboriginal Indians, and where you cannot move a step in those forests which are soaked with moisture all the year round, without meeting with some remarkable and unknown vegetable form. I then went through the province of Segovia, and through a succession of terrace-like highlands, reached mountain regions where the Fir tribe already predominate at an elevation of 4 to 5000 feet, and I was surprised at finding myself among a mixture of northern and tropical plants. I have further examined the entire western slope between the Nicaragua sea and Realejo, and the province of Guanacaste, where the Catinga vegetation makes its appearance in its most characteristic form. It is, however, my lengthened sojourn in the interior mountains of Costa-Rica and my ascent to the numerous volcanos, some of which (Irasu and Turialva) rise to 11,000 feet, which have produced the principal portion of the plants which are the subject of the following pages. To the distinguished English botanist, G. Bentham, Esq., who has kindly undertaken the *Leguminosæ*, *Labiatæ*, *Scrophularineæ*, *Acanthaceæ*, and *Compositæ*, which I brought back from my voyage, I am further indebted for the determination and description of the following species, with the exception of a few, marked as such, respecting which personal observations on the living plants, or a more abundant supply of specimens, enabled me to institute a more full examination, and better to determine them; which applies particularly to the genera *Ravnia*, *Xerococcus* and *Ophryococcus*.

[Here follows the notice, with remarks and descriptions of the new species, of all the *Rubiaceæ* detected by Dr. Oersted, and belonging to the genera *Galium*, *Rubia*, *Borreria*, *Spermacoce*, *Diodia*, *Mitracarpium*, *Richardsonia*, *Cephaelis*, *Gypsophila*, *Psychotria*, *Nonatelia*, *Palicourea*, *Coffea*, *Ixora*, *Chiococca*, *Guettarda*, *Sabicea*, *Hamelia*, *Alibertia*, *Gonzalea*, *Oldenlandia*, *Rondeletia*, *Pentagonia*, *Lindenia*, *Portlandia*, *Macrocnemum*, *Condaminea*, *Calycophyllum*, *Bouvardia*, *Manettia*, *Exostemma*, *Lasionema*, *Buena*, *Ravnia* (gen. nov.), *Higginsia*, *Coccocypselum*, *Xerococcus* (gen. nov.), *Ophryococcus* (gen. nov.), *Randia*, *Genipa*, *Posoqueria*, *Stannia*; in all nine species. Professor Oersted then continues:—]

I have now given a view of the *Rubiaceæ*, amounting to about 100

species, which have been found by myself and others in Central America, taken according to its natural boundaries, which in fact differ but little from the political; namely the narrow portion of continental America situated between Panama and Tehuantepec*. I now proceed to offer some observations on their occurrence and distribution generally, and their proportion in the above country, as compared with other parts of tropical America. I have remarked already, that *Rubiaceæ* belong to those families, which perform in all respects an important *rôle* in that country. Scarcely a place can be named, from the coast, to an elevation of 7 to 8000 feet, in which those plants do not constitute the principal part of the vegetation, and on account of their very different appearances and qualities, contribute in a variety of ways to form the characteristic features. While the small *Spermacoceæ* appear mostly like weeds, as the *Stellatæ*, which they habitually resemble, in northern countries; and while *Coccocypselum* extends its creeping shoots over the ground, the widely spread *Chiococcæ* are almost climbing, and the handsome *Manettiæ* twining like *Convolvuli* among the branches of shrubs; and others (*Ravnia*, *Xerococcus*, and *Ophryococcus*) grow like parasites on the stems of trees, hanging down like *Gesneriæ*. But the majority are either shrubs or under-shrubs (*Bouvardia*, *Lindenia*, *Psychotria*, *Palicourea*, *Nonatelia*, *Chomelia*, *Rondeletia*, *Higginsia*, *Gonzalea*, etc.), or trees (*Sabicea*, *Alibertia*, *Macrocnemum*, *Calycophyllum*, *Genipa*), forming an essential part of the forests. Many of these are besides remarkable for their profusion of splendid blossoms (*Palicourea*, *Bouvardia*, and *Rondeletia*), or large and brilliant floral leaves (*Calycophyllum*, *Macrocnemum*), and belong to the ornaments of tropical forests.

In regard to the number of species, they are about equally distributed over the entire country; occurring as frequently in the humid primeval forest of the eastern side, as in the dry Catinga forest, which occupies the western slope; but here the large woody forms predominate. The forests of large tracts, particularly between Granada and Realejo, consist almost exclusively of so-called Madroño (*Calycophyllum candidissimum*), a lofty tree which, in the proper season, has a magnificent appearance, on account of its numerous white flowers and floral leaves;

* I shall take some other opportunity to attempt showing, that this portion constitutes one in all respects defined and natural whole. Central America has accordingly its characteristic flora, equally distinct from those of Mexico, the Antilles, and South America.

the wood being much valued for timber, especially for axle-trees. The so called Jagva or Juatil (*Genipa Caruto*) occurs likewise in great abundance in the during the dry season almost leafless forests; it is a low tree with a dense crown of ample glossy foliage, and with fruit resembling an apple. In their vertical extension, they gradually decrease, as might be anticipated, from the sea to 8000 feet, where they entirely cease; with this proviso, that while the greatest number of species belong to the low regions, the most luxuriant in growth as well as in the beauty of flowers, occupy the wet mountain region, at an elevation of 3500 to 7500 feet. It is here that the handsome *Rondeletiæ* and *Palicoureæ*, the magnificent *Macrocnemum*, called here Jasmin del monte, and the half-parasitical *Rubiaceæ*, have their proper home. These latter afford an example how plants belonging to families, otherwise widely different from each other, assume, according to certain circumstances, a great habitual similitude among each other. It is in this always moist atmosphere, which is so favourable for half-parasites, the trees being everywhere covered by Ferns, *Orchideæ*, *Aroideæ*, and *Gesneriæ*, that the *Rubiaceæ* themselves assume this character; *Ravnia* as well as *Hillia*, to which it is nearly allied, mimicking in a most deceptive manner some *Columneæ*, while *Ophryococcus* may almost be mistaken for a *Gesneria*.

Our knowledge of the flora of Central America is too incomplete to enable us to determine the absolute number of species of its *Rubiaceæ*. The preceding enumeration, as we have remarked already, contains in all probability scarcely one-half of them. R. Schomburgk's enumeration of the Flora of Guiana contains a much larger proportion than mine, namely 176 species; but this must be supposed to arise, in a great measure, from the steady increase of the family towards the equator, his whole number of phanerogamic plants scarcely surpassing my list of the flora of Central America, made from materials collected by myself. Here, as in all tropical America, the group of *Coffeaceæ* predominates in its *Euspermacoceæ* and *Coffeeæ*; that of *Cinchonaceæ* in its *Eucinchoneæ*, and a large part of *Rondeletieæ* and *Eugardenieæ*. It is mostly the same, or closely allied genera, which occur everywhere; while most species are peculiar to Central America; and thus the prevalent rule for the Rubiaceous family, that the species are confined in their locality, receives further confirmation.

The proportion of genera to species is very great, being 45. Those

peculiar to this flora are: *Pentagonia, Lindenia, Ravnia, Xerococcus,* and *Ophryococcus. Psychotria* (15), *Palicourea* (6), and *Rondeletia* (6), contain the most species. The genera, which are rich in species in adjoining countries, but either entirely wanting here, or scantily represented, are principally *Cephaelis,* of which only one species is met with, while there are 15 in Guiana; *Coffea* and *Faramea,* which are absent altogether, but abound in species in Guiana. Of *Spermacoceæ,* whose great extension may be attributed to their being for the most part weeds, only one species is peculiar to this flora, namely *Crusea longibracteata,* Benth.; but most species of the other sections are peculiar; such as 9 out 15 species of *Psychotria,* all *Palicoureæ* and *Rondeletiæ,* etc. Central America has altogether 14 species in common with Mexico*, 21 with the Antilles†, and 16 with South America‡. This community in regard to a great number of species with the Antilles, corresponds well with that dissemination to which J. D. Hooker has first drawn attention in his memoir on the Galapagos Archipelago, so highly important to the geographical botanist; namely, that most of the plants of those islands, which are not endemical, are common not only to Central America, but also to the Antilles: so that, since none of the Galapagos typical forms occur on the Continent, it must be presumed, that the former, being favoured by the western oceanic currents, have extended from the Antilles, which must accordingly be considered as their head-quarters§. Some species are widely spread over the entire tropical America, namely *Borreria verticillata* and *parviflora, Spermacoce tenuior, Chiococca racemosa, Hamelia patens, Coccocypselon canescens,* and *Oldenlandia herbacea,* which last appears likewise in all other countries of the world. It is probable, nevertheless, that a greater ac-

* *Galium uncinulatum, Rubia hypocarpia* and *lævigata, Borreria verticillata* and *Hænkeana, Spermacoce tenuior, Richardsonia scabra, Chiococca racemosa, Gonzalea spicata, Mitracarpium schizangium, Psychotria hebeclada, Palicourea mexicana, Oldenlandia herbacea,* and *Manettia cuspidata.*

† *Rubia hypocarpia, Borreria verticillata, parviflora,* and *Bartlingiana, Spermacoce tenuior, Diodia prostrata* and *barbata, Mitracarpium villosum, Cephaelis punicea, Psychotria pubescens, nervosa,* and *lævis, Nonatelia panamensis, Ixora ferrea, Chiococca racemosa, Hamelia patens, Gonzalea spicata, Oldenlandia herbacea, Manettia cuspidata, Exostemma caribæum,* and *Calycophyllum candidissimum.*

‡ *Borreria verticillata* and *parviflora, Diodia barbata, Psychotria nervosa, hebeclada, flexuosa,* and *alba, Chiococca racemosa, Oldenlandia herbacea, Alibertia edulis, Coccocypselon canescens* and *hirsutum, Genipa Caruto, Posoqueria longiflora, Calycophyllum candidissimum,* and *Condaminea corymbosa.*

§ Transactions of the Linnean Society, vol. xx. p. 163–262.

cumulation of materials than that which is at present at the disposal of botanists, and a more critical comparison than has hitherto been instituted between the *Rubiaceæ* of different parts of tropical America, may show that many species have a larger distribution. Thus, Hooker has proved, that all the American forms of the genus *Drimys* (*Winteri*, *chilensis*, *granatensis* and *mexicana*) are merely forms of one species, which therefore has as wide an extension as *Gentiana prostrata* and *Trisetum subspicatum*, which likewise occur throughout the Andes chain*. Bentham is of opinion, further, that all American species of *Chiococca*† must be considered as varieties only of *C. racemosa*, Jacq., which has accordingly a very wide extension. But, although it will also be gradually found, that a greater number of species are common to different countries, than was formerly supposed; yet, on the other hand, new characteristic species will be constantly discovered, and thus the proportion of species, peculiar to different floras, will remain the same.

Although the *Rubiaceæ* essentially preserve their character throughout tropical America, analogous species of the same genera occurring mostly everywhere; the large natural floras are distinguished partly by a certain number of peculiar genera, and partly by certain genera comprising a maximum of species, and lastly by certain species predominating in their number of individuals. I will confine myself in this place to point out briefly some of the chief differences which in these respects characterize the different floras, by way of comparison with that of Central America.

In the Antilles the genus *Psychotria* greatly predominates in regard to the number of species (about 50). The same is the case with *Exostemma*, of which *E. caribæum* is very common and prevalent on account of its number of individuals; which applies also to many *Spermacoceæ* (*S. tenuior*). Peculiar genera are: *Ernodea*, *Hoffmannia*, *Stevensia*, *Isidorea*, *Tertrea*, *Bignolia*, *Strumpfia*, *Stenostomum*, *Scolosanthus*, *Portlandia*, and *Erithalis*.

In Mexico the genera *Galium*, *Borreria*, and *Bouvardia* have the greatest amount of species. Peculiar are: *Sommera*, *Margaris*, *Deppea*, and *Hexasepalum*.

In Guiana the *Cephaelideæ* have their proper home; they have only

* The Botany of the Antarctic Voyage.

† Namely; *C. densifolia* and *anguifuga*, Mart.; *macrocarpa*, *coriacea* and *staminea*, Mart. et Galeot., *phænostemon*, Schlecht., and *nitida*, Benth.

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a few representatives in Mexico, Central America, and the Antilles. Besides 15 species of *Cephaelis*, there are here two peculiar genera of the group, *Carapichea* and *Patabea*. Besides, *Coffea*, *Faramea*, *Psychotria* and *Palicourea* abound in number of species. Peculiar genera are: *Rudgea*, *Malanea*, *Octavia*, *Cordiera*, *Patima*, *Ladenbergia*, *Endolithodes*, and *Commianthus*.

On the eastern slope of the Andes, between 19° S. and 10° N., in the moist mountain regions between 4800 and 7200 feet, *Cinchonaceæ* form the grand characteristic of the forests; but beyond those limits they occur only sparingly, according to Weddel's recent researches*, and they fail altogether in other parts of tropical America.

Borreria prevails greatly in the Galapagos, inasmuch as one-half of all their *Rubiaceæ* (16) belong to that genus. In the low dry region from the sea to 1000 feet, its species form, with *Euphorbiaceæ*, the leading character of those islands†.

In the flora of Brazil, *Declieuxiæ* are the most characteristic of the family; there being about 50 species, while the genus is almost entirely wanting in other countries. Also the *Cephaelideæ*, of which there are two peculiar genera, *Salzmannia* and *Sutera*; *Cephaelis Ipecacuanha* is one of the commonest plants, especially in the province of Mato Grosso, 30,000 lbs. of this important medicinal root being gathered annually‡. There are a great number of species of *Coccocypselum*, *Augustea* and *Borreria*, and peculiar to this place are *Triodon*, *Staelia*, *Alseis*, *Psyllocarpus*, *Schreibersia*, *Scepseothamnus*, *Gardeniola*, *Thieleodoxa*, *Anisomeris*, *Emmeorrhiza*, *Himatanthus*, *etc.*

Florula Hongkongensis: *an Enumeration of the Plants collected in the Island of Hong-Kong, by* Major J. G. Champion, 95*th Reg.*, *the determinations revised and the new species described by* George Bentham, Esq.

(*Continued from* vol. iv. p. 335.)

Asclepiadeæ.

1. Toxocarpus *Wightianus*, Hook. et Arn. Bot. Beech. p. 200. Hedges near West Point.

* Monographie du genre *Cinchona*.
† J. D. Hooker, l. c.
‡ Weddel on *Cephaelis Ipecacuanha*, in Ann. des Sciences Nat., vol. xi. p. 93.

1. Holostemma (Graphistemma) *pictum*, Champ., sp. n.; glabrum, foliis subcordato-oblongis acuminatis, coronæ stamineæ lobis 5 gynostegium subæquantibus.—*Habitus* ut inflorescentia generis. *Folia* petiolata, 4–5 poll. longa, fere 2 poll. lata, basi sinu parvo sæpius cordata. *Umbellæ* demum in racemum simplicem v. bifidum extensæ. *Flores* quam in *H. Rheedii* paulo minores. *Sepala* ovata, obtusa, vix linea longiora. *Corolla* subrotata, glabra, fauce nuda, laciniæ ovales, obtusissimæ, 4–5 lin. longæ, intus eleganter purpureo et flavo pictæ. *Corona* staminea imo gynostegio inserta, breviter annularis, lobis 5 erectis ovatis simplicibus lateribus reflexis, sinubus latis, dente brevi lato auctis. *Antheræ* membrana terminatæ. *Massæ pollinis* elongata, ab apice pendulæ. *Stigma* depressum. *Folliculi* 2–3-pollicares, basi ventricosi, læves.

Ravines of Mount Victoria, flowering during summer. Although the staminal corona in this plant shows a considerable difference from the entire or slightly-lobed ring of the other species of *Holostemma*, approaching in some respects to that of *Symphyoglossum*, yet in all other characters, as well as in habit, the species is so evidently allied to *H. Rheedii*, that I have preferred considering it as indicating a section of *Holostemma* (for which I propose the name of *Graphistemma*), to adding to the number of small genera founded on nice and not always natural distinctions, with which the Order is already overloaded.

3. Asclepias *Curassavica*, Linn.—Dcne. in DC. Prodr. vol. viii. p. 566.

Naturalized all over the island.

4. Tylophora *hispida*, Dcne. in DC. Prodr. vol. viii. p. 610.

Common about Victoria.

5. Marsdenia *tinctoria*, Br.—Dcne. in DC. Prodr. vol. viii. p. 613.

Ravines of Mount Victoria. The corollas are rather larger than in my Indian specimens, and slightly contracted at the throat, so as to appear rather urceolate than campanulate, but the plant is in all other respects the same as the Indian one.

6. Stephanotis *Chinensis*, Champ., sp. n.; ramulis pubescentibus, foliis cordato-ovatis acuminatis supra sparse subtus ad venas hirtellis, corollæ laciniis ovato-lanceolatis tubo sublongioribus, corona staminea antheris multo breviore.—*Caulis* alte volubilis, ramis molliter pubescentibus. *Folia* fere *Raphistemmatis pulchellæ*, sinu tamen baseos minus aperta, novella fere undique pubescentia, adulta supra pilis paucis conspersa subtus ad venas venulasque plus minus hirta. *Pe-*

dunculi ad apices ramulorum brevium breves, 2–3-flori. *Bracteæ* parvæ, squamæformes. *Pedicelli* 7–8 lin. longi. *Calycis* laciniæ oblongæ, obtusæ, $3\frac{1}{2}$ lin. longæ. *Corolla* alba, glabra, tubo 5 lin. longo, crasso, basi subventricoso, intus notato, lineis pilosis 10 ad altitudinem gynostegii attingentibus, basi et apice alternatim conniventibus; laciniæ 9–10 lin. longæ, patentes, falcatæ, hinc basi auriculatæ. *Gynostegium* tubo corollæ dimidio brevius. *Coronæ staminea* foliola 5, gynostegio adnata, antheris multo breviora, apice brevissime libera, simplicia, integra. *Antheræ* terminatæ membrana elongata apice concava. *Massæ pollinis* erectæ, ellipsoideæ, brevifixæ. *Stigma* crassum, subpentagonum, obscure bilobum.

A single plant was found in April, 1849, climbing over the top of a small Oak-tree in the thick jungle of the Happy Valley. It had a beautiful appearance even at some distance. The waxy white flowers have in the daytime a slight and agreeable perfume, but at night the scent is delicious, resembling that of the Tuberose. The general habit and foliage are those of a *Pergularia*, or still more of *Raphistemma*, but the structure of the staminal apparatus is precisely that of *Stephanotis*, with which genus it also agrees in the size, form, and consistence of its flowers; perhaps however the whole genus *Stephanotis* might with more propriety be considered as a section of *Pergularia*.

7. Gymnema *sylvestris*, Br.—Dcne. in DC. Prod. vol. viii. p. 621: var. *Chinensis*; foliis subcoriaceis nitidulis præter costam glabris.

Near the Hong-Kong magazine-guard.—Besides the want of all pubescence on the leaves except along the midrib, as observed by Hooker and Arnott (Bot. Beech. p. 200), and by Schauer (Pl. Meyen. p. 364), this form differs slightly from the Peninsular specimens in the consistence of the leaves, which are more leathery and smooth, with less prominent veins. The flowers are also not quite so small, the scales of the throat thicker and broader, with shorter decurrent lines of hairs, and the membranes at the top of the anthers are rather larger. But these are probably all of them variable characters.

8. Pentasacme *Championi*, Benth., sp. n.; glaberrima, foliis anguste lanceolatis acuminatis acutis, pedunculis 3–8-floris, corollæ laciniis e basi lata anguste linearibus, squamulis faucis latis subdenticulatis, antheris obtusis, stigmate subrostrato.—*Herba* glaberrima, habitu *P. caudatæ* simillima. *Caules* e rhizomate perenni erecti, $1-1\frac{1}{2}$-pedales, simplices v. parce ramosi. *Folia* 2–3-pollicaria, 3–4 lin. lata, in

acumen acutissimum desinentia, basi breviter acuta, petiolo lineam longo. *Umbellæ* extraaxillares, pedunculo vix petiolum æquante, pedicellis gracilibus, floridis 2–3 lin., fructiferis fere 6 lin. longis. *Calycis* foliola lineam longa, ovato-acuminata. *Corolla* alba, subrotata, profunde 5-fida, laciniis e basi ovata anguste linearibus, 2½ lin. longis, intus papillosis. *Squamæ* faucis breves, latæ, truncatæ, denticulis parvis v. obsoletis. *Antheræ* membrana ovata inflexa terminatæ. *Massæ pollinis* subglobosæ, non pellucidæ. *Stylus* in apiculum brevem apice obtusum v. bidentatum productus. *Folliculi* in specimine meo lineares, teste Champion oblongo-ventricosi acuminati.

An elegant species, growing in waterfalls amongst the spray, and flowering from May to August. Abundant in the Happy Valley waterfall, in a rill on Mount Gough, etc. It may possibly prove to be a mere variety of the *P. caudata*, but the floral characters do not agree sufficiently well with those described by Decaisne for me to venture to unite them, without better materials than I now possess to enable me to judge of the variations of the Silhet plant.

904 9. Dischidia *Chinensis*, Champ., sp. n.; foliis ovatis obtusis basi cuneatis, umbellis subsessilibus capitatis, corollæ tubo globoso, coronæ stamineæ foliolorum lobis lineari-oblongis recurvis.—*Herba* more generis carnosa, glabra, ad nodos radicans; ascidia non vidi. *Caulis* tenuis. *Folia* 8–9 lin. longa, fere *D. Rafflesianæ* sed angustiora. *Flores* parvi, glomerulis subsessilibus. *Calycis* lobi minuti. *Corolla* lineam diametro, laciniis ovatis obtusis tubo globoso dimidio brevioribus intus (latere hinc replicato adnato) valde incrassatis, fauce pilis paucis intus ciliata. *Coronæ stamineæ* foliola cum laciniis multo angustiora quam in *D. Rafflesiana*.

In ravines on rocks; Mount Victoria.

10. Hoya *carnosa*, Br.—Dcne. in DC. Prodr. vol. viii. p. 636.

Abundant in ravines on rocks, especially those of Mount Victoria.

Loganiaceæ.

1. Mitrasacme *capillaris*, Wall.—A. DC. Prod. vol. ix. p. 11.—*M. Malaccensis*, Wight, Ic. t. 1601. f. 2.—*Limnophila campanuloides*, Wall. Cat. n. 3908.

Stony places towards West Point. Rare in Hong-Kong, but has a wide geographical range; I have it from the East Indian Peninsula,

from Malacca and Tavoy. The *M. Chinensis* described by Grisebach (Pl. Meyen., p. 51), from the mainland of China, appears to be the same as *M. nudicaulis* of Reinwardt, a Sumatra plant gathered also in the Khasya by Griffith. A third East Indian species is *M. Indica*, Wight, Ic. t. 1601. t. 1, or *M. pusilla*, Dalz. in Kew Journ. Bot. vol. ii. p. 136, which must be closely allied to, if not identical with, *M. trinervis*, Spanoghe, Linnæa, vol. xv. p. 335, from Timor.

2. Strychnos *colubrina*, Linn.—A. DC. Prodr. vol. ix. p. 14. var.?

Happy Valley, flowering in spring. This plant differs from Wallich's description of *S. colubrina*, in the leaves being broader in proportion to their length, and in the berry, which, when ripe, is red and of the size of a plum. I have no Silhet specimen to compare, and ascertain whether there may not be other differences of more importance.

3. Strychnos *paniculata*, Champ., sp. n.; glabra, subscandens, foliis ovatis 3–5-plinerviis coriaceis nitidis, paniculis thyrsoideis terminalibus multifloris, floribus tetrameris, corollæ tubo brevissimo.—*Rami* debiles, elongati, subscandentes, cirrhis spinisve (an semper?) destituti. *Folia* ovata vel sublanceolata, superiora bipollicaria, brevissime petiolata, 1–1½ poll. lata, acutiuscula, basi cuneata. *Inflorescentia* fere *Ligustri Sinensis*, minute puberula. *Flores* ejusdem fere magnitudinis, numerosi, sordide albi, fragrantes. *Pedicelli* lineam longi. *Calyx* minutus, laciniis 4 ovatis margine ciliolatis. *Corollæ* tubus vix semilineam longus, laciniæ 1½-lineares, ovatæ, basi intus longe barbatæ, cæterum glabræ. *Filamenta* fauci inserta, secus tubum intus decurrentia, antheris breviora; hæ majusculæ, oblongæ, corollæ laciniis paulo breviores. *Ovarium* biloculare, glabrum, in stylum apice subcapitato-stigmatosum desinens. *Ovula* in quoque loculo circa 12. *Baccæ* magnitudine *Cerasi*, abortu pleræque monospermæ.

Woods in the Happy Valley, found in flower in May, 1849.

4. Medicia *elegans*, Gardn. et Champ., in Kew Journ. Bot. vol. i. p. 325.

Scarce in Hong-Kong, but more abundant among the hills of the opposite Chinese coast. The embryo, according to Major Champion, is fleshy, nearly filling the cavity of the seed, the cotyledons ovate, the radicle conical and slightly curved. Walpers is probably right (Ann. Bot. Syst. vol. iii. p. 73) in referring to this genus the *Leptopteris* of Blume, although the species may not be identical.

GENTIANEÆ.

Exacum *bellum*, Hance, in Walp. Ann. Bot. Syst. vol. iii. p. 77.

On the top of Mount Gough and Mount Victoria, flowering in July.

GESNERIACEÆ.

1. Æschynanthus *Chinensis*, Gardn. et Champ. in Kew Journ. Bot. vol. i. p. 328.

Trailing over rocks and ravines, and rather local.

2. Chirita *Sinensis*, Lindl. Bot. Reg. 1844, t. 59.

Common in beds of ravines among the hills. The narrow-leaved variety mentioned by Hance (Kew Journ. Bot. vol. i. p. 141) grows abundantly in a ravine on Mount Gough.

CONVOLVULACEÆ.

1. Argyræa *acuta*, Lour.—Chois. in DC. Prodr. vol. ix. p. 333.

Ravines of Mount Victoria.

2. Ipomœa *pentadactylis*, Chois. Conv. Or. p. 89, et in DC. Prodr. vol. ix. p. 385.

This plant agrees with Choisy's description, except that in the leaflets which are rather broader, and differs from the allied species by the sepals all very blunt, the interior ones considerably longer than the others. It cannot however well be the West Indian *Convolvulus tenuifolius* of Vahl, adduced by Choisy as a synonym to this species with the omission of Vahl's station.

The *I. fulvicoma* mentioned by Hance, Kew Journ. Bot. vol. i. p. 176, is unknown to me.

3. Jacquemontia *violacea*, Chois. in DC. Prodr. vol. ix. p. 179 (flore cæruleo).—*Convolvulus ianthinus*, Hance, in Walp. Ann. Bot. Syst. vol. iii. p. 113, ex charactere dato.

This species, well known in our hothouses under the name of *Convolvulus pentanthus*, is quite naturalized in a ravine above the town of Victoria.

The *Evolvulus pudicus*, Hance, in Walp. Ann. Bot. Syst. vol. iii. p. 215, is not in the collections before me, but, from the character given, it cannot differ from the *E. alsinoides*, Linn., which is common all over East India, as well as in most hot parts of the world.

4. Cuscuta *reflexa*, Roxb.—Chois. in DC. Prodr. vol. ix. p. 454: var.

densiflora; floribus subsessilibus in racemos ovatos densissimos congestis, calycis laciniis obtusioribus.

Little Hong-Kong. Flowers fragrant. Choisy is no doubt right in reuniting with *C. reflexa* the two supposed species distinguished by Sweet under the names of *C. verrucosa* and *C. Hookeri*, but his character requires modification. The loose racemes are exceptional and peculiar perhaps to Wallich's Calcutta garden specimens, and I never find the calycine segments so narrow and pointed as one would be led by the words of the diagnosis to fancy them.

Major Champion had observed several other Convolvulaceous plants growing in the thickets and gullies of the island near the sea, but had not any opportunity of collecting them.

Boragineæ.

1. Ehretia *longiflora*, Champ., sp. n.; glabra, foliis ellipticis oblongisve acuminatis integerrimis, corymbis folio brevioribus multifloris, corollæ infundibuliformis tubo lobis patentibus plus duplo longiore.—*Arborea. Folia* subtripollicaria, venis paucis a costa divergentibus, venulis omnino inconspicuis, petiolo 3–5 lin. longo. *Inflorescentiæ* minute tomentellæ. *Pedunculi* infra corymbum nunc brevissimi, nunc 1–2 poll. longi. *Calyx* linea brevior, laciniis ovatis obtusiusculis. *Corolla* alba v. lilacina, glabra, tubo fere 5 lin. longo superne ampliato, laciniis anguste ovatis 2 lin. longis. *Genitalia* longiuscule exserta. *Stylus* apice breviter bifidus, lobis dilatatis truncatis subretusis. *Ovarium* carnosum, glabrum; loculis 4 parvis, ovulis infra apicem affixis pendulis. *Fructus* non visus.

Happy Valley woods, etc., flowering in April. The tree from which the "One-tree Hill" takes its name belongs to this species.

2. Tiaridium *Indicum*, Lehm.—*Heliophytum Indicum*, DC. Prodr. vol. x. p. 556.

Waste places near the sea-shore.

3. Bothriospermum *tenellum*, Fisch. et Mey.—DC. Prodr. vol. x. p. 116. A weed in rice-fields.

(To be continued.)

BOTANICAL INFORMATION.

Further remarks on the Climate and Vegetation in Bombay; by Dr. J. E. Stocks, Conservator of Forests and Superintendant of the Botanic Gardens, Bombay Establishment; extracted from a letter addressed to the Editor, dated Mahableshwur, May 26th, 1852.

In regard to the growing of plants we have at least three varieties of climate within sixty miles of Poona.

1. That of the Table-land of the Deccan, in which are the *two* Botanic Gardens. Here the rains are comparatively small, 24–30 inches during June, July, August, and September. The winter is cool, and in it "*Europe*" Flowers (annuals) are cultivated with success *by irrigation*. The dryness and heat are considerable in Spring—March, April, May. Furniture warps, soil splits, delicate plants wither. In this climate the *Guttiferæ, Orchideæ, Zingiberaceæ, Piperaceæ*, and other *purely* tropical plants, which require a perpetually moist air, do not flourish, except by painfully careful watering. *Euphorbia antiquorum* and others, *Calotropis, Capparis aphylla, Balanites Ægyptiaca, Acacia Arabica*, etc., growing wild, speak as to the hygrometrical condition of the climate. The annual rain, however, and a low latitude, save the Deccan from being like the Scinde hills, and in irrigated gardens, many good things grow. Thus in the Dapour and Heura Gardens, *Jonesia Asoka, Olea fragrans, Bougainvillæa, Petræa volubilis, Schinus Molle* (Dr. Gibson's pet), *Cæsalpinia coriacea* (Divi Divi), *Olea Europea*, Sandal-wood, *Blighia sapida, Caryota urens, Cupressus torulosa, C. glauca*, Logwood, Mahogany, *Ceratonia Siliqua, Rauwolfia*, etc., grow; while *Hyoscyamus niger* and *Leontodon Taraxacum* grow well and are prepared for the medical stores. As wild annuals in the cold weather, *Anagallis arvensis* and *Veronica anagalloides* occur. In the rains, too, English vegetables are grown, Peas, Cabbages, etc., so that we have two crops of "Europe" vegetables—a cold-weather crop, which takes advantage of the sun's diminished heat in winter, and a rain crop, which takes advantage of the moisture and coolness produced by the rains. Scinde can only grow vegetables in the cold weather. I should like to try *Peppermint* and *Liquorice*, which I think would *pay*, for be it known that Government only allows £30 a month for the two gardens, and we have to sell and dispose of all we can, and to make ourselves generally useful, besides growing hosts of vegetables.

2. The moist and hot climate of the Concans, where *Guttiferæ*, *Myristaceæ*, *Zingiberaceæ*, *Orchideæ*, and the like grow. Here I think we shall get up a small garden, and so be enabled to grow things from "India aquosa"—the Eastern Islands—and so get a climate like Falconer's garden at Calcutta.

3. The climate of Mahableshwur, where I now am, whose elevation (2500 feet above the Deccan and 4500 above the sea) and whose *awful* monsoon rain (250 inches) give a different vegetation, and (oh ye powers!) what a different climate to the sensations! How pleasant it is now, living though I am in a slight tent! to my feeling far superior to what I remember of England. Yet piety forbids me to thoroughly think so, and suggests that it may be pleasant by contrast from Scinde and Belochistan. Well! I hope to try in 1855. The balmy feel of the day and the nice cold nights, which demand a couple of blankets, contrast well with what the Deccan is now, with its *perspiration* by day and its *tossing* by night. And then, too, the morning strawberries and cream, and the mealy Mahableshwur potatoes, and the Fuchsias and Heartsease in the gardens, and the flowers new to me I meet every day on the hill-sides and rocky slopes,—all these predispose a man to take a favourable view of everything around him. But to be precise, or as far as I can, being here but a botanical griffin, having to make out each individual plant, and groping my way like a puppy opening its new eyes—processes unfavourable to a general view, which requires previous and digested knowledge. The chief trees are species of *Eugenia*, *Memecylon*, *Flacourtia*, *Pittosporum*, *Glochidion*, *Terminalia*, etc. etc. The chief shrubs, *Randia dumetorum*, *Griffithsia fragrans*, *Casearia*, *Solanum giganteum*, *Embelia*, *Mæsa*, *Chloripetalum*, *Celastrus*, etc. All over the hills are coming out the broad leaves of a *Roscoea*, of a golden-flowered *Zingiber*, of *Musa superba*, and of several *Aroideæ*. *Ledebouria* enamels the turf, with a pretty *Habenaria*, *Adhatoda trinervia*, *Curculigo*, *Iphigenia (Anguillaria Indica)*, *Hypoxis*, *Crinum*, etc. etc. All over grows a brake with "King Charles in his oak," and the "Spread Eagle," as in the well-remembered English plant, while a pretty *Osmunda* near waterfalls, *Wahlenbergia dehiscens*, *Utricularia*, *Plantago Asiatica*, and others, differ considerably from any plants found in the dry Deccan or the steamy Concan. Geraniums, Fuchsias, Heartsease, and other old favourites, grow here in the open air, flowering and looking fresh even in May, which is the disheartening month in India *generally*, and dries

everything up. And now, in a fortnight, the rains will commence, and everybody will go off the hills; for truly there is no living through a three months' shower-bath, with the clouds living on familiar terms with you, and walking in and out of your house, without so much as "By your leave, fair sir!" After the rains in October it is said to be delightful, and the landscape one sheet of emerald green, variegated with *Orchideæ* and other *Monandriæ*, and during the winter the cold is severe. I have got an idea into my head that by sowing at the close of the rains (the drip of the rains on the young plant, sown at their commencement, would kill) the Deodar Pine would grow here. At all events I see no harm in trying, as it has succeeded well on the Neilgherries, whose climate squares well with this, only this has by far the greatest amount of rain. So I shall see if I can get a few acres of land, and try a few things here; and I should fancy things from the *United States* would do well here, and why not try Gooseberry, Currant, Cherry, etc.? I think I shall be able to send you *Mosses* from this place: all the trees are "bearded like the pard" with mosses and lichens grey, and on them Orchideous parasites abound. Ferns too are very common, whether on tree, dry ground, bare rock, or under the drip of the numerous waterfalls. I am travelling about with half-a-dozen Ward's cases, and shall be able to send you one, after the rains, should you desire it, stuffed with *Orchideæ* and *Zingiberaceæ*, of which we have several unique ones, as you may see by reference to Graham's catalogue. I think the Golden-spiked Ginger, now just coming in, may be new, but then I cannot say positively, as I have not access to any monograph, and even to many books, from which I may learn it is an old one; at all events I shall try and collect all I can in *Orchideæ*, *Zingibereæ*, *Musaceæ*, *Marantaceæ*, and any good things I can send you. Please, however, to consider any accounts, and details, and descriptions, and ideas, and plans, and schemes, which I now emit, crude and liable to total change on further experience. I should have mentioned that the Mango will not succeed on Mahableshwur, and that some Spanish Oaks grow very well. But I must see Mahableshwur at other seasons than for a few days in May, to judge of its true character. A bitter east wind is said to blow all winter. I should much like a few ornamental climber and creeper seeds, as foreign *Ipomœas*, *Tropæolums*, etc., for the ornamental garden of the Governor. I may here add that since writing the above I have arrived at Dapooree, and I see that *with care*

and constant hand-watering many better things will grow here than I had expected. I do not think any seeds will come amiss, except *Arctic ones.* We have an English gardener here, a good man.

I received this day your parcel of seeds, quite wet by being in contact with Mr. Law's plants, but shall try the seeds, and perhaps they will not be spoiled. For it many thanks, and especially for the *Victoria*, which I must beg again next year rather earlier, say to leave England in February. One of the seeds had thrown out a kind of shoot in the bottle, which had rotted and caused a fermentation, but the rest seem good, and if we can only manage to get it to flower, it will be an era in the history of the Botanic Garden.

NOTICES OF BOOKS.

Sartwell, H. P., M.D., etc. : *Carices Americæ Septentrionalis exsiccatæ.* Part II. Penn Yan, New York, 1850.

In our volume for 1850* we had the pleasure of noticing the first part of this valuable work, consisting of beautifully preserved specimens, correctly named, of the *Carices* of the United States, and we expressed our hope that it would meet with encouragement in this country as well as in the United States. We trust we may infer, from the appearance of a second part, that such has been the case. In addition to the 70 species and varieties of the first Fasciculus, we have 88 now given; 158 in all, neatly attached to folio paper within a portfolio. The species are as follows:—71. C. disticha, *Huds.* 72. C. scabrior, *Sartw.* 73. C. Leavenworthii, *Dew.* 74. C. alopecuroides, *Tuck.* 75. C. Cephalonica, *Dew.* 76. C. straminea, *Schkh.* 77. C. alata, *Torr.* 78. C. crinita, *Lam.*, var. 79. C. Woodii, *Dew.* 80. C. Meadii, *Dew.* 81. C. pallescens, *L.* 82. C. conoidea, *Schkh.* 83. C. grisea, *Wahl.* 84. C. flaccosperma, *Dew.* 85. C. Davisii, *Schw. et Torr.* 86. C. formosa, *Dew.* 87. C. gracillima, *Schw.* 88. C. virescens, *Muhl.* 89. C. hirsuta, *Willd.* 90. C. plantaginea, *Lam.* 91. C. Careyana, *Dew.* 92. C. platyphylla, *Carey.* 93. C. retrocurva, *Dew.* 94. C. digitalis, *Willd.*

* Where the Author's name is by mistake printed Cartwell.

95. C. anceps, *Willd.* 96. C. blanda, *Dew.* 97. C. ignota, *Dew.* 98. C. oligocarpa, *Schkh.* 99. Do. var. Sartwelliana, *Dew.* 100. C. Hitchcockiana, *Dew.* 101. C. eburnea, *Booth.* 102. C. pedunculata, *Muhl.* 103. C. Baltzellii, *Chapm.* 104. C. umbellata, *Schkh.* 105. C. Emmonsii, *Dew.* 106. C. lucorum, *Willd.* 107. C. Pennsylvanica, *Lam.* 108. C. varia, *Muhl.* 109. Do. var. pedicellata, *Dew.* 110. C. Richardsoni, *Br.* 111. C. præcox, *Jacq.* 112. C. pubescens, *Muhl.* 113. C. Chapmanni, *Sartw.* 114. C. miliacea, *Muhl.* 115. C. scabrata, *Schw.* 116. C. Sulivanti, *Booth.* 117. C. arctata, *Booth.* 118. C. debilis, *Mx.* 119. C. venusta, *Dew.* 120. C. capillaris, *L.* 121. C. flexilis, *Rudge.* 122. C. Cherokeensis, *Schw.* 123. C. flava, *L.* 124. C. Oederi, *Ehrh.* 125. C. filiformis, *L.* 126. C. lanuginosa, *Mx.* 127. C. vestita, *Willd.* 128. C. Halsayana, *Dew.* 129. C. striata, *Br.* 130. C. Houghtoni? *Torr.* 131. C. lacustris, *Willd.* 132. C. aristata, *Br.* 133. C. trichocarpa, *Muhl.* 134. C. comosa, *Booth.* 135. C. Pseudo-Cyperus, *L.* 136. C. histricina, *Willd.* 137. C. tentaculata, *Muhl.* 138. Do. var. rostrata, *Sartw.* 139. C. intumescens, *Rudge.* 140. C. Grayii, *Carey.* 141. C. Elliottii, *Schw. et Torr.* 142. C. folliculata, *L.* 143. C. rostrata, *Mx.* 144. C. turgescens, *Torr.* 145. C. subulata, *Mx.* 146. C. lupulina, *Muhl.* 147. C. lupuliformis, *Sartw.* 148. C. squarrosa, *L.* 149. C. stenolepis, *Torr.* 150. C. retrorsa, *Schw.* 151. C. Schweinitzii, *Dew.* 152. C. monile, *Tuck.* 153. C. ampullacea, *Good.* var. *utriculata*, Carey. 154. C. bullata, *Schk.* 155. C. Tuckermani, *Booth.* 146. C. oligosperma, *Mx.* 157. C. longirostris, *Torr.* 158. C. glaucescens, *Ell.*—All the specimens are perfect in regard to inflorescence, and are beautifully prepared.

TORREY, PROFESSOR: *Catalogue of Plants collected during Captain Howard Stansbury's "Expedition to the Valley of the Great Salt Lake of Utah."*

This forms the Appendix D to the very interesting work above quoted, the narrative of a journey from Fort Leavenworth on the Missouri to one of most extraordinary spots in the vast territory of the United States, viz. the Great Salt Lake of Utah; no less remarkable for its natural peculiarities, than for its being in the course of five years,

settled and peopled by the religious body known by the name of "Mormonites."

Our concern is with the plants, amounting to about 110 species, chiefly collected in the wide-spread saline districts around, and during a survey of the lake. The new species in this small collection are—1. *Streptanthus crassicaulis*, Torr. (tab. 1), *Cowania Stansburiana* (tab. 3), *Heuchera rubescens*, Torr. (tab. 5), *Lynosyris serrulata*, Torr., *Monothrix* (n. gen.) *Stansburiana*, Torr. (tab. 6), *Eutoca heterophylla*, Torr., *Amblirion pudicum*, Torr. (*Lilium*, Ph., *Fritillaria*, Nutt., Hook.—Tab. 9)*. Had a botanist been attached to the party, as is usual in the United States exploring Expeditions, no doubt the collection would have been much more extensive, and there would have been greatly more novelty.

N. B. Ward, F.R.S., F.L.S.: *On the Growth of Plants in closely Glazed Cases.* Second edition. Small 8vo. London, 1852.

Although modestly called a second edition, this valuable work has many additions, alterations, and improvements; and not a few elegant embellishments from the talented pencils of E. W. Cook, Esq., and Mrs. S. H. Ward. In the Preface to this edition the author tells us that, "for the growth of plants in all situations, even in those unfavourable to their development in the open air, the use of these cases is daily becoming more extensive," and he believes "that it would be difficult to specify any plant intractable of culture in the closed cases, where its natural conditions, with respect to heat, light, etc., have been fulfilled. As to the conveyance of plants on ship-board, the plan is now universally adopted, and it is believed that there is not a civilized spot on the earth's surface which has not, more or less, benefited by their introduction."—This is quite true: and the subject is here most judiciously and popularly treated,—both philosophically and practically; and throughout written with a spirit of cheerfulness, and an admiration of the works of God, which add no little to the charm of the volume.

* Besides the entirely new species, some of the rare ones, or varieties, are figured, for example, *Phaca mollissima*, Dougl., var. β, *Utahensis*, tab. 2. *Spiræa dumosa*, Nutt., tab. 4. *Chænactis achilleæfolia*, Hook. et Arn., var. β., tab. 7. *Malacothrix sonchoides*, Torr. et Gr., tab. 8.

The Flora of South Australia, *displayed in its fundamental features, and comparatively; by* Dr. Ferdinand Müller, *of Adelaide. In a Letter to* R. Kippist, Esq., Libr. L.S. Translated and communicated by Mr. Kippist. [Read before the Linnean Society, December 7, 1852.]

The peculiar plant-forms, which in so high a degree distinguish the vegetation of Australia from that of other parts of the world, are far more strongly marked in the warmer temperate, than in the subtropical zone; since, as we approach the tropical regions, they assimilate more and more with an Indian Plant-world, and eventually contend with it for the mastery. Beneath the cooler parallels of Australia, certain predominant families of plants, embracing genera and species equally singular and varied, yet agreeing in their fundamental forms, establish unmistakeably this physiognomy of Flora. Its principal features are formed by the *Myrtaceæ* with their innumerable *Eucalypti* and *Melaleucæ*, the not less frequent *Acacias* with dilated petioles; then Papilionaceous plants, distinguished by simple, and usually stiff leaves; the leafless *Casuarinas*, the *Xanthorrhœæ*, improperly called "Grass-trees," with the scarcely less remarkable *Santalaceæ*, *Stylideæ*, *Goodeniaceæ*, and *Hæmodoraceæ*. For the rest, the vegetation of Australia accords indisputably better with that of South Africa than with any other; since many of the great Natural Orders, as the (for the most part) rigid *Proteaceæ*, the pretty Everlastings, the aromatic *Diosmeæ*, the Ice-plants, *Polygaleæ*, certain *Büttneriaceæ*, smooth-stemmed *Cyperaceæ*, *Restiaceæ*, *Thymeleæ*, and lastly, the *Epacrideæ*, which so closely resemble the Cape Heaths,—all these range most nearly, if not exclusively, with the South African Orders.

These general characters however are by no means equally well-marked throughout the whole of extratropical Australia: on the contrary, although in a somewhat constrained manner, the flora may be divided, by characters dependent on the prevalence or disappearance of these families, into a western, southern, eastern, and Tasmanian flora.

In the west, the *Leguminosæ* predominate to such a degree, that they form, with the scarcely less widely-spread *Proteaceæ*, nearly one-fourth of the entire vegetation! After these, it is the great abundance of *Myrtaceæ*, *Epacrideæ*, *Stylideæ*, *Goodeniaceæ*, *Cyperaceæ*, *Orchideæ*, *Hæmodoraceæ*, *Dilleniaceæ*, *Restiaceæ*, *Büttneriaceæ*, *Tremandreæ*,

Hepaticæ, *Aphyllantheæ*, *Droseraceæ*, *Amaranthaceæ*, *Lobeliaceæ*, and *Irideæ*, which give the principal character, and have rendered this part of the country so celebrated among botanists. Ferns on the contrary, Grasses, *Violarieæ*, *Rubiaceæ*, and apparently *Salsolaceæ* also, are, comparatively speaking, of rare occurrence there. If we further remark that only about one-sixteenth of the species agree with those of South Australia, it may serve as a measure of the peculiarity of this flora.

We perceive, on the contrary, but few marked differences, in the eastern flora, compared with that of South Australia, although there are still far fewer points of contact to be discovered with it than with the Tasmanian. For in the East, not only do the *Proteaceæ* and *Epacrideæ* again increase, and indeed in a twofold degree, but we likewise find an augmentation in the number of Ferns, *Restiaceæ*, *Polygaleæ*, and *Dilleniaceæ;* the *Compositæ*, *Salsolaceæ*, and *Myoporineæ*, on the contrary, being evidently fewer than in the southern flora, with whose species only about one-seventh perfectly coincide; whilst of the Tasmanian species more than one-fourth are identical with those which are indigenous here.

The above-mentioned near relationship is disturbed, not only by the greater profusion of Ferns, which love an insular climate, by the doubled amount of *Epacrideæ*, which there, in union with a subalpine flora, clothe the high mountain-tops, by the increased number of *Restiaceæ* and *Polygaleæ;* but also on the other hand by the fact that *Goodeniaceæ*, *Salsolaceæ*, and *Myoporineæ*, are but weakly represented there, and that *Loranthaceæ* and *Cæsalpineæ* entirely cease.

It has been already imperfectly shown in these remarks, how preeminently Southern New Holland is distinguished by the profusion of *Compositæ*, *Salsolaceæ*, *Myoporineæ*, *Halorageæ*, *Cæsalpineæ*, *Caryophylleæ*, and *Cruciferæ;* a profusion which, nevertheless, is only relative, since the orders of plants which here most strikingly predominate, rank in the following manner, according to the number of their species, viz.: *Compositæ*, *Leguminosæ*, *Algæ*, Grasses, *Myrtaceæ*, *Cyperaceæ*, *Salsolaceæ*, *Orchideæ*, *Fungi*, *Goodeniaceæ*, *Cruciferæ*, *Myoporineæ*, *Proteaceæ*, *Diosmeæ*, *Epacrideæ*, *Umbelliferæ*, *Malvaceæ*, *Musci*, *Scrophularineæ*, *Liliaceæ*, *Rhamneæ*, *Labiatæ*, *Thymeleæ*, Ferns.

The number of Dicotyledons truly indigenous here is rather more than four times as great as that of the Monocotyledons; but if we do

not extend the limits of the flora farther than the 34th degree of south latitude, the proportion becomes as 7 : 2, and therefore holds the mean between the proportions which prevail in Van Diemen's Land and New South Wales; while in Western Australia (nearly agreeing with the more extended observations here) the number of Monocotyledons is surpassed more than fourfold (2 : 9), and the Acotyledons more than sixfold, by the Dicotyledons.

The *Compositæ* and *Leguminosæ* here exceed numerically all other families, to so great a degree, that taken together they embrace nearly one-third of the Dicotyledons, and in the southern districts actually form more than one-fifth of the entire vegetation; indeed, if we extend the limits of our comparison back to the subtropical districts, they compose nearly one-fourth of the entire flora. Of this the *Compositæ* alone constitute one-eighth, a proportion which is higher than in any other part of Australia, and little less with reference to the entire mass, than it is in South Africa. Van Diemen's Land participates most in this superabundance of *Compositæ*.

These comparisons, it is to be observed, were instituted in a level district, which corresponds tolerably well with that of Tasmania, and founded on collections from such tracts of land as show the most strongly marked contrasts, namely, in Western Australia, between the Swan River and King George's Sound; and in the east, between the 33rd and 36th degree of south latitude.

We must not however place too implicit reliance upon the numerical proportions here set forth, but rather regard them for the present as approximative only, since, even in the regions of Australia just compared, whose flora we have only learnt to know with the present century, there is a residue too important to be left out of consideration; moreover, the difficulty of instituting a comparison is much increased by the want of a general work on the plants of this fifth continent, until the appearance of which the attempt to take a comprehensive view will remain greatly disturbed.

The entire number of species indigenous to the province of South Australia, I estimate at not much less than 2000; of which up to this time between 1300 and 1400 have been discovered. But to these, nearly 100 species are already to be added, which, having migrated, partly from Europe, partly from the Cape, have become naturalized here, beyond the possibility of extirpation. Probably, too, the number

of hitherto undiscovered plants will be but little less here than in Van Diemen's Land, or in a corresponding area of New South Wales, although for the same space in Western Australia, we must assume 3000 species.

In these different parts of the country, the water-plants more especially correspond; then the shore- and meadow-plants; and among them more Monocotyledons than Dicotyledons, till at last, among the more simply organized Acotyledons we meet only (or nearly so) with species which belong at the same time to a great part of the earth.

It is further worthy of remark, that we are sufficiently indemnified by the variety of forms, for the acknowledged paucity of plants, in comparison with the vegetation of Western Australia; since 1168 true Cotyledonous plants, which I have hitherto found within the limits of this Colony, are divided into 452 genera and 99 Natural Orders, whilst there, 2000 species are referable to only 430 genera and 91 families; in which calculation, as also in the former proportions, the imported plants are not taken into account.

After these general considerations we will endeavour to exhibit, in a few brief touches, the picture of the landscape, as far as it depends on the grouping of plants. But as within the limits of this sketch I am unable to develope the proportions with more than proximate completeness, so in like manner I must frankly admit that, owing to the gradual blending together of the groups of vegetation, and the frequently sudden extinction of species, I have not always been able to succeed in assigning even to the principal forms, which could alone be taken into account, their most appropriate station; but since I have hitherto been able to meet with scarcely any delineations of the vegetable kingdom from this point of view, this sketch may suffice for the present, as a basis for future labours.

The coast-border of South Australia is formed either of a muddy alluvial land, of sandy plains, or of a rockly upland, of which the last is almost wholly denuded of vegetation, while the plants of the other parts do not differ materially from the common shore-flora of extra-tropical Australia. The noble *Avicennia*, a pioneer of the vegetable kingdom, borders the sea-shore here, as in most countries of the eastern hemisphere, and forms, with a *Melaleuca* and *Myoporum insulare*, both following the channels of the coast, the only trees. In richer abundance however along the muddy low grounds, which have

been newly recovered from the sea, occur the *Samolus littoralis*, *Rhagodias*, *Atriplex*, *Enchylæna*, *Kochia*, *Halocnemum*, *Arthrocnemum*, *Chenopodineæ*, *Frankenia*, *Erythræa*, *Spergularia*, and other salt plants, to which, from the cliffs and out of the creeks, *Asperococcus*, *Scaberia*, *Sargassum*, *Cystoseira*, *Thamnophora*, and other species of seaweed, are thrown up. Great rarities are hardly to be found here, but we may nevertheless call attention to *Laurencia* and *Wilsonia*. In *Mesembryanthemum* is seen a connecting link with the South African, in *Nitraria* with the Siberian, and in *Crantzia* with the North American flora.

The sandy coasts, on the contrary, are overrun with *Mesembryanthemum inæquilaterale* (the so-called native fig), *Eurybia lepidophylla*, *Angianthus*, *Leucophyta*, the delightfully fragrant *Alyxia capitellata*, *Threlkeldia xerotina*, *Ammophila*, *Xerotes fragrans*, which resembles a stemless Palm, *Lepidosperma gladiatum* (a rush with Iris-leaves), *Spinifex*, the creeping *Kunzea*, *Leucopogon Richei* (both shrubs with eatable fruits), *Acacia Sophoræ*, and other truly Australian plants, with which are associated *Atriplex cinereum* and *Salsola australis*, of European type. In spite of this by no means meagre vegetation, the aspect of this coast is sad and monotonous, since it is treeless, save that a few scattered *Casuarinas* perhaps in some degree enliven the endless waste.

Towards the interior these plants gradually disappear before the bushes which clothe the sand plains, in which the Sandarach Cypress (*Callitris Preissii*), whose crowns, pyramidal in youth, become sparingly ramified in old age, and the *Exocarpus*-trees, from their twigs being borne down to the earth, afford shady and, on account of the blooming character of the surrounding country, most charming resting-places. But the want of water, that necessary spring of life, even where it does not entirely preclude us from penetrating into the wide wilderness of Australia, permits us to bestow only a fleeting glance at the rich treasures for which these regions are so pre-eminent. We may be permitted merely to call to mind the *Cassias*, the numerous *Acacias*, with such wonderful forms, *here* intermixed with the vermilion-red *Dillwynia*, *Brachycome*, *Pogonolepis*, *Loudonia*, the golden Centaurea-formed *Podolepis*, *Chrysocephalum*, *Pomaderris* and *Hibbertia*, *Polycalymma*, and other everlasting flowers; and *there*, again, accompanied by the Croton-like *Beyeria*, by woolly *Pimeleas*, full of acrid sap, *Dampieras*, *Hakeas*, stemless *Xanthorrhœas*, hard, piercing rushes, and

the *Festuca bilobulata.* Then again, we have the lovely *Corræas* and other capital *Diosmeæ*, which increase the variety; and we have especially to notice a host of other plants, where the stunted *Eucalypti*, in crowded masses, give rise to the gloomy and monotonous character of the landscape, which travellers, on account of the immeasurable extent and ever-varying height of these dwarf forests, have so aptly designated as "a sea of bushes." But nowhere is the plant-world of Australia so inexhaustible, nowhere in the play of colours and forms more full of variety, than in those retired districts, where, too, the original flora has been least disturbed by the over-luxuriance of foreign intruders.

In particular districts the country becomes lighter, and on argillaceous and calcareous soils are seen other moderate-sized *Eucalypti*, of the type of *E. odorata*, without however being crowded together, like that species, in the thickest parts of the sandy soil. Many bushes and shrubs moreover vary the physiognomy of this scrub-district, to which the viscid *Dodonæas* and *Zygophylleæ* are peculiar; the splendid *Eremophila alternifolia*, and the closely allied species of *Stenochilus*, with their spotted flowers, to which are added high bushes of *Hakea* and leafless *Daviesia*, here and there overshadowed by the gummiferous *Pittosporum acacioides*, by *Myoporum platycarpum*, or Sandal-trees.

The sterile mountain-regions approach, in the character of their vegetation, the bush-covered plains. Their noblest representative is the stringy-barked *Eucalyptus* (*E. fabrorum*), a mighty tree, with shining leaves, and stems straight as a line. *Casuarina quadrivalvis* and *Banksia australis*, the only small trees which are usually associated with it, sufficiently indicate a transition to a better soil, while the most barren and stony heights are occupied by the palm-stemmed *Xanthorrhœa quadrangulata*, *Acacias*, *Pultenæas*, *Daviesias*, the unapproachable *Isopogons*, *Platylobium*, *Tetratheca*, *Leucopogon*, *Leptospermum*, *Brunonia*, *Hakea*, *Grevillea*, *Calycothrix*, large-flowered *Eurybias* (which we are accustomed to call *Olearias*), *Ixodea*, *Calostemma*, *Helipterum*, *Stackhousia*, *Hardenbergia ovata*, the species of *Pimelea*, and so many more of the favourites of our gardens, which unite to form a perfect parterre, among which the fiery-red *Stenantheras* and *Astrolomas*, and a host of charming species of *Epacris*, are pre-eminently conspicuous. *Bursaria spinosa* here always bears the aspect of a stunted shrub, although in the deep vegetable mould of the eastern districts it

appears as a stately tree. Ferns and *Orchideæ* belong rather to the deep shady valleys, which, in the places liable to be overflowed, are filled with *Leptospermum*. The Ferns embrace the more tropical genera, *Adiantum*, *Gleichenia*, *Gymnogramme*, *Lindsæa*, *Cheilanthus*, and *Lomaria*, and likewise approach the common forms in *Osmunda*, *Asplenium*, *Botrychium*, *Ophioglossum*, and *Pteris*. But the observer will in vain search for a rich harvest of Mosses and Lichens, and with some degree of perplexity inquire after the reason of their paucity in species, where nevertheless all the requisite conditions for their simple vital processes are afforded in such a high degree.

The majority of the water and shore plants of these valleys, as well as those of the brackish lagunes and canals, are, as already pointed out, common to several parts of the world; or (if we except *Ocymum*, *Clidanthera*, Grasses formed after an Indian type, *Callistemon arborescens*, entangled bushes of the evanescent-leaved *Polygonum junceum*, *Schachtia*, and other shore plants of the Murray), deviate so little from the usual character that they are incapable of fixing our attention to this place; and in like manner it happens, with reference in many respects to the flora of the mountain pastures and of the fertile lowlands, if we overlook the smooth-barked *Eucalypti* (*E. robusta*, *E. leucoxylon*, *E. patentiflora*), we find ourselves surrounded by forms so characteristic of Fatherland as *Ranunculi*, *Cardamine*, Willow-herbs, *Geranium*, *Galium*, *Scorzoneras*, *Gnaphaliums*, *Picris*, *Cynoglossum*, Chanterelle, *Campanulas*, Eye-bright, Willows, *Ajuga*, Plantains, Docks, Mint and Germander, Knot-grass (*Polygonums*), Rushes, Darnel, *Poas*, etc.

The original features of the flora become every year less and less discernible, since the large-flowered species of Sundew, the native Wood-sorrel, the *Tillæas*, *Acæna*, *Lotus*, *Swainsonia*, the deep-red *Kennedya*, *Sebæa*, the delicate daisy-like *Brachycome*, *Craspedia*, *Cymbonotus*, *Pimeleas*, *Psoralea*, *Bulbine*, the lovely *Anguillarias*, *Cæsias*, *Caladenias*, *Thelymitra*, and spotted species of *Diuris*, disappear more and more, and the pretty groups of gum-dropping Acacias (*A. retinoides*, *A. pycnantha*) vanish for ever, either, with *Exocarpus cupressiformis* and *Acacia Melanoxylon*, before the ploughshare, or because their astringent barks find employment in commerce.

How powerfully the transforming influence of the imported vegetation acts upon the original flora may be readily observed in the neigh-

bourhood of Adelaide, where the Australian grass, now growing only in scattered tufts, has made way for a thick turf of *Poa annua*, *Briza*, *Kœleria*, etc. That the cultivation of grain, which has so completely transformed one part of the wilderness of Australia, has already exercised so beneficial an influence on the increase of the rain, may serve as an indication of the probable results from the diffusion of the nomadic grasses in the desert interior of New Holland, the full importance of which can scarcely be predicted, or even perhaps imagined.

Ost-Indiens hittills kända Pilarter. (*The Willows of the East Indies hitherto known.*) By N. J. Anderson. Presented on the 11th of March, 1851, to the Royal Academy of Sciences at Stockholm, and printed in their Transactions for 1850. Stockholm, 1851, p. 465. Translated by Dr. Wallich, V.P. Royal and Linn. Soc.

Having had an opportunity last year to examine the Willows preserved in the botanical collections at Berlin, Paris, and London, partly in order to study authentic specimens, and partly to obtain materials for a monograph of the genus, which I have in hand, I met with a not inconsiderable number of new and hitherto undescribed species, throwing much additional light on the question of its extension and forms in different parts of the world. No country however received such an increase of its Willow-flora as the East Indies, twenty-two entirely new and undescribed species being added to the six already known species.

It is of importance that contributions towards a more complete acquaintance with certain widely spread and interesting groups of plants should be published, and attention directed not only to what is supposed to be known already, but also to those gaps which may thereby become more manifest. I therefore present my descriptions of such East Indian Willows as have come under my observation to the Royal Academy of Sciences, in order that they may be published in the Transactions, if deemed worthy of it.

To my knowledge only six species have hitherto been more or less described from that extensive country; namely, *Salix tetrasperma* of Roxburgh's Plants of the coast of Coromandel; *S. disperma* (doubtful),

cuspidata (*apiculata*, mihi), and *Japonica* (doubtful), of Don's Prodromus Floræ Napalensis; and *S. nobilis* and *lenta* (doubtful), of Fries's Novitiarum Floræ Suecicæ Mantissa prima. In Wallich's Lithographic List of the East India Company's Herbarium the following Willows are entered: n. 3697, *S. Lindleyana*, Wall.; n. 3698, *obovata*, Wall. (*flabellaris*, mihi); n. 3699, *elegans*, Wall. (*denticulata? himalensis*, mihi); n. 3700, *grisea*, Wall. (*Wallichiana*, mihi); n. 3701, *kamounensis*, Lindl. (*denticulata*, mihi); n. 3702, *ichnostachya*, Lindl.; n. 3703, *cuspidata*, Don (*apiculata*, mihi); n. 3704, *eriostachya*, Wall.; n. 3705, *pyrina*, Wall.; n. 3706, *glabrescens*, Lindl. (**macrocarpa*, mihi); n. 3707, *tetrasperma*, Roxb.; n. 3708, *urophylla*, Lindl.; and n. 3709, *babylonica*, Linn. Among additions in the catalogue are n. 9102, *S. calophylla*, Wall.; n. 9103, *densa*, Wall., and three unnamed numbers (9104, 5, and 6), all of which are doubtful to me, as the specimens have no fructification. When I was in London Mr. Kippist gave me opportunities to study the above Willows, in the East India Company's Herbarium presented to the Linnean Society. Specimens of many of them are also preserved in the Banksian Herbarium; so that my descriptions are founded often on the examination of numerous specimens. Through the great liberality of Dr. Klotzsch, I received from Prince Waldemar of Prussia's herbarium, three species, provisionally determined by the Doctor, which had been gathered in the Himalayas by the late Dr. Hoffmeister; namely, *S. himalensis* (*denticulata*, **himalensis*, mihi), *rotundifolia*, Royle (*flabellaris*, mihi), and *Roylei* (*hastata*, Linn.). But it was at Paris where I obtained the greatest accession of of novelties from the rich collections of Perrottet, and especially of V. Jacquemont, made during his extensive travels in the East Indies, in 1829–31. Some of these had already been determined by Jacquemont in his travelling notes preserved in the library; but most of his names, as also the Wallichian, had been applied already to other well-known species, and required to have others substituted. Finally, through Prof. Liebmann's great kindness, I have had an opportunity to look over Horneman's exotic Willows, and thereby to become better instructed respecting some doubtful forms. After having thus become acquainted, in the three richest museums, with Wallich's, Lindley's, Jacquemont's and Klotzsch's opinions respecting the South-Asiatic species of the genus, and having reduced their determination to uniformity among themselves and with those before known, I am now able to offer

with certainty the following descriptions of twenty-five species, of each of which I have examined more or less numerous specimens. Of three species, published by Don and Fries, I have added the descriptions by these authors, as I have not myself seen specimens of them, nor been able to reduce them to any heretofore known sorts; and finally I have added the three above-mentioned additional species of Wallich's catalogue, as undeterminable and doubtful. This number, however large it may appear for a southern and tropical country, will no doubt be considerably augmented when Dr. J. Hooker publishes his collections made in the Himalayas; they will prove more effectually than the following enumeration, that the Willow has a wide extension unusual for woody plants; that the species are distributed over mountainous tracts in a manner corresponding to climatic conditions, where they appear, if not under the same, yet under somewhat analogous forms. For it appears, on examining the known East Indian Willows, that two of our alpine species, *S. arbuscula* and *retusa*, are quite analogous with *S. flabellaris* and *Lindleyana*, which grow high on the Himalayas, where they occur either in a luxuriant or crippled form, as is the case with ours. On the northern highlands of Nipal species grow which are unequivocally related to our North of Europe forms: *S. apiculata* (cognate with *pentandra*), *denticulata* (with *hastata*), *myricæfolia* (with *repens* and *sibirica*, or *versifolia*), **macrocarpa* (with *phylicæfolia*), *julacea* and *Wallichiana* (with *Caprea*); nay, *S. Caprea*, *hastata*, *daphnoides*, and *viminalis* themselves are found there, in no way varying from those in northern countries. To the westward, in the neighbourhood of Persia, where forms approaching *S. alba*, etc., are quite common, India produces *S. babylonica*, *dealbata*, and *glaucophylla*, manifestly of the group of *S. alba;* and *S. babylonica** is not rare here. It is first in the lowlands of tropical India, on the banks of the Ganges and Berhampooter, that species having a tropical type, are found, which, by their similarity in many respects, exhibit what may be properly called an *East Indian Willow-group*, whose representatives further occur in the Sunda Islands and South China; namely, *S. tetrasperma*, *pyrina*, *urophylla*, *eriostachya*, *psilostigma*, *ichnostachya*, *suaveolens*, *populifolia*, *calostachya*, and *nobilis*. With the exception of those species, which belong to the mountains and highlands, and which may be met with also in similar situations of the Old World, all the other Indian Willows are quite peculiar to their countries; and if they in some instances, as just mentioned, extend

* Sic in textu.—*N. W.*

in an easterly direction, these are but few in number; and towards the westward they do not appear to extend at all. The fact is, there is in India a distinct group of Willows, precisely as the promontory of South Africa, the Canaries, Brazil, Mexico, and several other regions, have their more or less peculiar forms of this eminently varying genus. This group is distinguished by the shining bark of the branches, firmer and generally shining leaves with entire margins, lengthened apex, and glaucous under surface; and characteristic are, above all, their long, loose, mostly sessile male aments, having the scales arranged in separate verticils, very concave and commonly covered with woolly hairs; enclosing 8–10 stamens; the filaments capillary, villous below, and often recurved; the anthers small, round, and of a golden-yellow colour. The form of the female aments, and the size, figure, and covering of the capsules, vary considerably; but the style is mostly wanting, the stigma resting on the apex of the capsule in the shape of a cross.

The East Indian species of Willows, of which the following are the descriptions*, may be arranged in this manner:—

I. Amerina, *Fr.*

1. S. apiculata, *And.*
2. S. babylonica, *Linn.*
3. S. dealbata, *And.*
4. S. glaucophylla, *And.*

II. Vetrix, *Fr.*

5. S. daphnoides, *Vill.*
6. S. viminalis, *Linn.*

III. Caprea, *Fr.*

* *cinerascentes.*

7. S. Caprea, *Linn.*
8. S. julacea, *And.*
9. S. Wallichiana, *And.*

** *virentes.*

10. S. hastata, *Linn.*
11. S. *macrocarpa, *And.*
12. S. denticulata, *And.*

*** *nigricantes.*

13. S. myricæfolia, *And.*

IV. Tropicæ v. Indicæ.

* *capsulâ pedicellatâ.*

14. S. tetrasperma, *Roxb.*
15. S. pyrina, *Wall.*
16. S. urophylla, *Lindl.*
17. S. ichnostachya, *Wall.*
18. S. colostachya, *And.*
19. S. suaveolens, *And.*
20. S. nobilis, *Fr.*

** *capsulâ sessili.*

21. S. eriostachya, *Wall.*
22. S. populifolia, *And.*
23. S. psilostigma, *And.*

V. Frigidæ.

24. S. flabellaris, *And.*
25. S. Lindleyana, *Wall.*

* These are omitted here.—Ed.

Incertæ.	Dubiæ.
S. disperma, *Don.*	S. calophylla, *Wall.*
S. japonica, *Don.*	S. densa, *Wall.*
S. lenta, *Fr.*	S. ? *Wall.*

Remarks on Guaco-plants. *By* Berthold Seemann.

Among the numerous plants used by the inhabitants of America to counteract the effect of the bites of venomous snakes, those called Guacos or Huacos occupy a prominent place. Some extraordinary stories are related of them, but it remains to be ascertained how far they can be depended upon, and travellers will have yet to identify the vernacular names of these plants with their respective scientific appellations. Dr. M. Colazio, a friend of mine, found the Indians of Central America very dexterous in catching the most dangerous snakes. They were never bitten by them; on the contrary, the reptiles seemed to fly their presence, and if taken wound in their hands as if touched by a hot iron. On asking for an explanation of so remarkable a phenomenon, the natives informed him that they had "guaconized" themselves, *i. e.* taken Guaco, which, if true, would prove the plant to be not only an antidote but also a prophylactic. Great misconception appears to prevail, and much has been written, about the plant which ought to be considered the true Guaco. But the fact is that nearly every country has its peculiar Guaco. At first the name was probably confined to only one species; when however in newly discovered regions the original plant was not found, the appellation was transferred to another that happened either to resemble it in appearance or possess similar properties. The derivation of the word "Guaco" could doubtless throw some light upon the subject; unfortunately it is unknown. Some spell it Guaco, others Huaco, and in Peru, Ecuador, and the Isthmus of Panama the same name is applied to the ancient Indian tombs; but whether there is any connection between the name of the plant and that of the native burial-places I have no means of determining, nor do I know to which of the American languages the word belongs. It sounds most like a corruption of a Quichua one, and if this should prove to be the case, those who spell it "Huaco" would be the most correct.

The Guaco plants are referred by most authors to an *Aristolochia*, a *Mikania*, and some unknown *Convolvulacea*. In the interior of Ecuador the inhabitants showed to me pieces of wood bearing the name of Guaco, and said to have come from the coast. They were extremely bitter, but their structure and size differed entirely from any of those to which I have alluded. The Guaco of Nueva Granada is the *Mikania Guaco*, Humb. et Bonpl. (Plantes Equinoxiales, tab. 105), the variegated leaves of which render it a conspicuous object in a forest, and make it a matter of surprise that it is not more frequently met with in our gardens now that plants with similar foliage are so much in fashion.

In Mexico several plants are called Guaco or Huaco, and Dr. Pablo de la Llave seems to have been eagerly collecting materials for a general article on them. Among his posthumous papers is one on this subject, which apparently is unfinished, and would have been much better left unpublished; but as it has already appeared in a Mexican periodical, I shall make the following extracts from it:—"I have received from Cordoba," says the Mexican naturalist, "four plants, all of which, though specifically distinct, bear the name of Huaco; and moreover I possess six creepers from other parts, to which the same appellation is given. One of the latter is an *Aristolochia*, and I want to direct particular attention to the circumstance that it is a very distant part of South America whence it came, and where it is known by name of Huaco, and as a plant counteracting the venom of snakes, and that here in Mexico the same appellation is given to creepers which possess the same properties,—a remarkable coincidence, from which it would appear that a far more active exchange of ideas has been carried on between the untutored many than among the learned few*.

"The Cordoba plants belong to the genus *Mikania*, but I find none of them described in Sprengel's 'Systema Vegetabilium,' though they approach closely to several species enumerated in that work, and I therefore subjoin the following diagnosis of them:—

"I. MIKANIA CORIACEA, *La Llave*.

"Caulis volubilis, striatus, foliorum insertionis puncto-annulatus; pe-

* The author, in order still further to prove this "comercio activo en la materia de conocimiento," quotes several instances where, in different countries, the same names are given to similar animals.—*B. S.*

tiolus striatus, basi in cylindrum auctus et incrassatus, tertiam folii partem longitudine æquans. Folia 6–8-pollicaria, alterna, elliptica, coriacea, cordata, breviter acuminata, integerrima, glabra, lucida, utrinque nervis tribus prominentibus canaliculatis aut striatis, de medio ad basin nonnil angustata, lobis cordatis brevibus rotundatis approximatis. Vulgo dicitur, 'Huaco.'—La Llave in 'El Mosaico Mexicano,' tom. ii. p. 299.

"Grows on the banks of the Rio Blanco, Hacienda of Guadalupe, two leagues south of Cordoba.

"Having received of this species only imperfect specimens, without any flowers, and finding that it had alternate leaves, I began to doubt whether it actually belonged to *Mikania;* but in submitting it to M. Manuel Bustamenta, Professor of Botany of our Museum (Mexico), that gentleman assured me that the leaves very much resembled those of the living Huaco plant in the National Garden, brought thither from Chiapas. Another circumstance which induced me to consider it a *Mikania*, was that on chewing for some time a piece of the leaves a pungent sensation is perceived, followed by a bitter taste, which immediately attacks the salivary glands.

"II. MIKANIA REPANDA, *La Llave.*

"*Folia* 8-pollicaria, opposita, longe petiolata, ovato-cordata, margine versus apicem integro, versus basin repando, utrinque scabra, nervis quinque striatis et prominentibus, lobis baseos magnis et rotundatis. Vulgo appellatur, 'Huaco macho.'—La Llave, l. c. p. 299.

"Very abundant about Cordoba. My specimens were obtained on the farm of Corral y San Antonio.

"III. MIKANIA ANGULATA, *La Llave.*

"*Folia* opposita, longe petiolata, 5-nervia, nervis canaliculatis, ovato-cordata, obtusiuscula, versus apicem integra, versus basin lobis profunde cordatis dentato-angulatis, supra scabra, subtus villoso-subtomentosa. Nomen vernacul. 'Huaco hembra.'—La Llave, l. c. p. 299.

"Very abundant about Cordoba.

"The two latter species, Nos. 2 and 3, were in flower, and are undoubtedly true *Mikanias*. The difference however between them is very slight. The margin of *M. repanda* from being entire gradually

becomes angulated, and even here and there leaves occur which exhibit small teeth.

"IV. Mikania Tlalixcoyan, *La Llave.*

"*Folia* oblonga, cordato-hastata, integra, glabra, nervis quinque striatis, lobis cordatis magnis divaricatis. Vulgo dicitur, 'Huaco.'—La Llave, l. c. p. 299.

"This fourth species, of which I have only seen imperfect specimens without flower, is found at Tlalixcoyan, in the canton of Vera Cruz. On chewing its leaves a slight pungency is perceived, which is succeeded by an aromatic tingling bitter (un amargo aromatico y espirituoso), and leaves the taste of cloves."*

The Rice-Paper Plant.

In our last notice of the Rice-Paper Plant†, we announced the welcome intelligence of the arrival at the Royal Gardens, from Hongkong, of two living specimens (see Vol. IV. p. 347) through the exertions of the Messrs. Bowrings, father and son. These continue in a flourishing condition. The next mail from China brought us an interesting Report, printed in the "China Branch of the Royal Asiatic Society's Transactions," from the pen of J. C. Bowring, Esq., "On the Rice-Paper Plant and its uses." At a previous meeting of the Society, Mr. Bowring had the high gratification of exhibiting a living specimen of the plant; and having since then, he observes, "obtained through Mr. Sinclair, the interpreter to the Fuh-chow consulate, some interesting information on the subject of it, I now beg to lay the same before the Society."

After alluding to the application that was made by us, he continues:

"Within a few weeks from the receipt of this letter, the kind exertions of the late Mr. G. G. Sullivan, H.B.M. Consul at Amoy, suc-

* We quite agree with Mr. Seemann that such miserable characters of plants professing to be of medical interest, "had better have been left unpublished."—Ed.

† Mr. George Bennett has recently written to me from Australia, and referred me to a figure of the Rice-Paper Plant which he has published in the second volume of 'Wanderings in New South Wales,' and of which I was not before aware. It is indeed an accurate representation of the true plant, from a drawing then in the possession of Mr. Beale at Canton, and is clearly identical with the drawing I have mentioned at our vol. ii. p. 29. Mr. Bennett's is the first published figure of the plant.—Ed.

ceeded in procuring for me, from the island of Formosa, six live specimens of this remarkable plant, four of which have been transmitted to England by the Overland route, two being retained here to give them a chance of flowering and fruiting in a genial climate. Since their receipt the latter have increased considerably in size, and are now in a very flourishing state.

"The *Tung-tsaou**, or Rice-Paper plant, grows abundantly in numerous parts of the island of Formosa. The names of the places where it is chiefly cultivated to advantage are, Ke-lung-shan (within the Taushwuy Sub-prefecture) and the three districts named Fung-shan, Kea-e, and Chang-hwa, all within 200 miles of the Chief-prefecture city, Tai-wan-foo, the capital of the Island, the furthest being Ke-lung-shan, at about 600 le from Tai-wan-foo. The extent of Ke-lung-shan, which is the largest of the Tung-tsaou plantations, is computed at 400 le in circumference; of this area nearly the whole is devoted to the rearing of the plant. The Tung-tsaou is said not to grow from seed, but to throw up shoots like the Bamboo from its roots.

"It forms a main source of revenue to the population engaged in its cultivation, and the inhabitants depend chiefly upon it for their maintenance. Lots of land are apportioned off to each, and every grower cultivates his own patch; the cultivation is under no monopoly restrictions, and Government seldom interferes.

"The plant is reported to be of a delicate nature, as suffering from a cold or damp air and withering in a bleak wind: a warm mild temperature appears to be a chief condition of its thriving. It is said not to attain a greater height than six Chinese chih, the average being from four or five chih; but considering the size of some of the specimens of pith received by me, which can scarcely be supposed to be produced by a plant of so small a size, this statement is probably incorrect. The young shoots appear above ground early in spring, and when a few inches high are carefully separated from the parent roots and transplanted into pots, in which they remain until about a foot high, when they are removed to land prepared for them. They are now carefully inspected every day that they may be kept free from insects, and are recommended to be protected from the sun by an awning until two or

* The Chinese name of the plant and the names of the places where it is cultivated are in the original further given in the Chinese character, which we cannot here furnish, and which, if we could, would not be intelligible to our readers.—Ed.

three feet high. They are planted equidistant and in rows, and not unfrequently on the sides of the hills.

"When the plants have attained their full growth, which is said to be in the tenth month, they are cut down, the twigs and leaves removed, and the stems left to soak for some days in running water, to loosen the bark and wood, and facilitate the removal of the pith. This last, after being cleaned and made into a cylindrical shape, is cut into convenient lengths, and is now ready for the hand of the paper-cutter, who performs his part as follows:—Taking a sharp broad-bladed knife, of which that now exhibited has been sent as a specimen, he makes a slight longitudinal incision in the cylinder of pith, which is then turned round gently and regularly on the edge of the knife, until the whole available material is planed off in thin even slices. Much care and dexterity are requisite to produce sheets of even thickness: if the operation is performed too hastily and the motion of the hand not properly regulated, the sheets will not take the required curl, and will come off in wrinkled masses. If, on the other hand, the paring is done too slowly, the paper is liable to come out of uneven thickness. This is the blunder which the Fuh-chow artisans are too apt to commit, and they are far behind the Formosa cutters, whose skill is truly admirable; one or two workmen at Amoy have however done wonders in this line, and deserve considerable praise.

"The skill of the workmen, and the appearance of the material, are well illustrated by the accompanying specimens*. No. 1 contains cylinders of the pith after the cleaning is finished and before the cutting of the paper commences. No. 3 shows what remains of the original cylinder after the whole of the available substance has been planed off, and the extreme tenuity of the specimens is evidence of the skill and nicety of the operation. Nos. 4 and 5 are small-sized sheets, cut, the former in Formosa, and the latter (which are dyed) at Fuh-chow. No. 6, sheets of full size. No. 2 contains a quantity of the spare shavings or cuttings which remain after the sheets are reduced to a regular form, and are sold as stuffing for pillows.

"The sheets of the smaller sizes are bought up by the flower manufacturers, dyed, and made into artificial flowers, for which an immense

* Thanks to Mr. Bowring and other friends in Hongkong, our Museum of Economic Botany now contains a very full collection of the several states of the Rice-paper, and the implements employed in its preparation.—Ed.

demand exists for headgear. The large sheets are prepared chiefly for the Canton and Tien-tsin markets, and are consumed by the water-colour painters; their cost is about 40 cash each. The small-sized (about three inches square) are made up in bundles of 100 each, and sold at Fuh-chow at about 45 and at Amoy at 35 cash per bundle. This extraordinary cheapness is evidence of the abundance of the plant in its place of growth, and more especially of the cheapness of labour. That a hundred sheets of this material, certainly one of the most delicate and beautiful substances with which we are acquainted, should be procurable for the trifling sum of 1¼*d.* or 1½*d.*, is truly astonishing; and when once the attention of foreigners is directed to it, it will doubtless be in considerable request among workers in artificial flowers in Europe and America, being admirably adapted to their wants.

"The comparatively high cost of the large sheets proves that the pith does not in general attain a great diameter, and the dimensions as shown in the lithographs (copied from Chinese drawings, and given at our Vol. II., Tabs. VIII. and IX.) must be looked upon as quite imaginary*. I have selected, from a large quantity sent me, some of the longest and thickest specimens, for the inspection of members†.

"The small remains of the cylinders of pith after the cutting of the sheets, are sold to the apothecaries' shops, and the decoction is said to be used as a diuretic; the price is mentioned as 10 cash per oz. The shavings are sold at 8 cash per oz.

"The trade has of late acquired considerable extension in many parts of the Empire. The Canton and Fuh-këen provinces are the chief consumers; the town of Fuh-chow alone is supposed to take off an annual supply to the value of not less than thirty thousand dollars, for consumption in the city and its immediate neighbourhood. The Rice-paper trade used formerly to be solely in the hands of Amoy and Chin-chew merchants settled at Amoy, from whence other departments were supplied; but since the latter end of the reign of Taou-kwang, vessels from Formosa have brought the article direct to Fuh-chow, where there are now two Hongs for its sale, but owned by Chin-chew or Amoy men.

* Mr. Bowring says in another place, that these drawings serve to show the extreme unfaithfulness of the Chinese artist, who would seem to have drawn largely on his imagination, and who probably never saw the plant he professed to portray. —Ed.

† The largest of these specimens measures twenty-six inches in length, and the thickest is rather more than six inches in girth.

"An attempt was made many years ago to introduce the plant into Fuh-chow, live specimens being brought over from Formosa, and planted and tended in the same manner as in their native country. They appeared to thrive for a time, but soon drooped and withered, and the experiment failed.

"The foregoing account, commencing with the words, 'The Tung-tsaou or Rice-paper plant,' (p. 80) is chiefly drawn up from a notice communicated by Mr. Sinclair; and its meagreness and defectiveness are not to be wondered at when, as Mr. Sinclair observes, it is so difficult to obtain accurate information from a people who in most cases know only the substances produced and their peculiar uses, without possessing the slightest knowledge of, or taking any interest in, the sources of production. The account of the cultivation of the plant, which in the original notice is much more diffuse than as given above, must be received with special caution*; and until we obtain a free communication with Formosa, we cannot perhaps expect to acquire much certain knowledge on this head.

"The idle stories which have been occasionally circulated regarding the danger attending the search after the plant in the Formosan forests, and the mode of barter between the natives of that island and the Chinese, are fully disproved by the cheapness and abundance of the supply, which we can only suppose to be kept up by regular and extensive cultivation.

"It is not a little strange that to the same family to which the Tung-tsaou belongs, viz. the *Araliaceæ*, or Ivyworts, another interesting and to this country most valuable plant is referable,—the Ginseng, which, although its root is so well known in commerce, and the plant itself has received a name (*Panax Ginseng*, Meyer), is also quite unknown to botanists. The plant which produces the Ginseng of America (*Panax quinquefolium*) is distinct from the Chinese or Tartar species."

HONGKONG, *October* 2, 1852.

One more little circumstance connected with the Rice-Paper is this moment (while I am writing) communicated to me by Dr. Bowring,

* The statement of the plant not growing from seed, but throwing up shoots like the Bamboo from its roots, we should think very improbable in the case of plants of this kind. The process of sowing the seed (as we have remarked in our Vol. II.) is represented by another Chinaman,—one with as much *knowledge* of the fact as the other.—ED.

while Acting-Governor of Hongkong, in the absence of Sir George Bonham. "It is a curious fact," he says, "that Lin, the author of the Opium war, and undoubtedly the most remarkable of modern public characters in China, was, when a youth, a manufacturer of artificial flowers from this Rice-paper material. I will send you the volume of the China branch of the Asiatic Society's Transactions, where you may (if you have time) honour some of my lucubrations with a moment's attention."—Fortunate it is for literature and science when such enlightened men as the Messrs. Bowring are placed in official situations in our distant Colonies.

THE BEGONIÆ OF MEXICO AND CENTRAL AMERICA. *By* Professor F. LIEBMANN. Communicated to the Association of Natural History at Copenhagen, April 14th, 1852. Translated by DR. WALLICH, V.P. Royal and Linn. Soc.

Although nearly 160 species of *Begonia* are described, and many attempts have been made to discover characters by which the genus might be subdivided into others, they have hitherto been fruitless; such being the sharply marked character of the genus, notwithstanding the habitual differences observable among the species, that a division of it of it would appear unnatural. Lindley has, it is true, tried to separate those with the outer and inner series of the perigonium differently coloured, under the name of *Eupetalum*; but botanists seem not to have approved of the attempt. Gaudichaud, in the 'Voyage de la Bonite,' established the genus *Meziera*, differing by wingless, six-ribbed capsules; but it is too little known as yet to decide with confidence on its stability. It must be recollected that wingless *Begoniæ* have been described before now, without detaching them from the genus; f. i. *B. aptera*, Blume.

It is this uniformity in its general character, no doubt, which has caused the systematic place of *Begonia* to be so uncertain; for as yet it connects itself naturally with no other known family. Old botanists placed it near *Polygoneæ;* more recent ones, among *Cucurbitaceæ;* neither location being appropriate; and it will certainly depend on the discovery of new good genera of this family, whether or not its real affinity to any other is to be developed.

The genus is spread both over the Old and New World, belonging with few exceptions only to the hot zone. The East Indies and Sunda Islands, especially Java, are its head-quarters in the Old World; only few species have been found in China and Japan, at Madagascar or the Cape. But all these form scarcely one-third of the number already known from America; and this preponderance will be augmented by a considerable increase of new forms contained in the present memoir. The 108 hitherto described American species extend from Brazil to the northern tropic, beyond which, as far as is known, none occurs. They are much more numerous in South America than in the tropical part of North America. Of 81 species of South American *Begonias*, as many as 57 belong to Brazil, forming as it were the centrum of the genus in South America. The other centrum is in North America, in Mexico, from whence 14 species have been made known; a number increased to 30 by those which I have discovered.

Generally the species have a very limited geographical extension, which no doubt may be accounted for by the nature of their localities; they being found in shady moist places, in the humid rich soil of primeval forests, in the depths of the Barrancas, and in the clefts of rocks; from all which places that great agency in the dispersion of plants, the wind, is excluded. I have only met with one species, *B. peltata*, Otto et Dietrich, growing on the dry and sunny trachyte-rocks in Mexico, but this plant, too, has only a limited extension. Hence it may be easily explained, why certain *Begonias* escape the travelling botanist's notice, and necessarily must do so, unless he visits the precise spots where they have been found before.

The following are the names of those who have contributed to our knowledge of Mexican and Central American *Begonias*.

In Francisco Hernandez's 'Nova plantarum regni Mexicani Historia,' a *Begonia* is delineated under the name of *Totoncaxoxo coyollin*, but the woodcut, like most of the others in the work, is so clumsy, and the description so imperfect, that no one has ventured to name the plant, which must accordingly be passed over as not to be determined.

Humboldt and Bonpland found two species in Western Mexico, *B. gracilis* and *populifolia*, H.B.K. But a far more considerable addition is due to the exertions of Schiede and Deppe, who partly forwarded dried specimens from Mexico, which were described by Schlechtendal and Chamisso, and partly seeds, which were raised in the Berlin

Botanic Garden, and published by Link and Otto. The species discovered by Schiede and Deppe are: *B. nelumbiifolia* and *heracleifolia*, Cham. et Schl.; *Martiana, monoptera, bulbillifera*, and *incarnata*, Link et Otto. Two species more, raised at the Berlin Garden from Mexican seeds, have been described, namely *B. peltata*, Otto et Dietr., and *punctata*, Klotzsch. The following have been raised and described in English gardens, without the discoverers or localities being indicated: *B. Barkeri*, Knowles et Westcott in Flor. Cab., *longipes*, Hook. Bot. Mag., and *incana*, Lindl. Bot. Reg. And finally *B. reptans* from Mexico has been described by Bentham in 'Plantæ Hartwegianæ.' These fourteen species comprise all Mexican Begonias hitherto known. As yet we are acquainted with only three species from Guatemala: *B. crassicaulis*, Lindl., *Lindleyana*, Walpers, and *setulosa*, Bertol., which last species is exceedingly imperfectly described. None is known from Nicaragua or Costa Rica. In the 'Voyage of the Sulphur,' Bentham has published *B. filipes* from Panama. To these must now be added my harvest gathered in Mexico, by which its *Begoniæ* become more than doubled, being raised from fourteen to thirty species. We are indebted moreover to M. Oersted for not less than ten new kinds from Nicaragua and Costa Rica, whence none had before been known.

(The systematic enumeration of the species which now follows is omitted, as it will be taken up in the works of De Candolle and Walpers.—Ed.)

BOTANICAL INFORMATION.

Notes on Botany in Italy. (From the 'Bonplandia.')

Florence, January 15, 1853.

Professor Bertoloni's 'Flora Italica' continues progressing very slowly, as is usual with botanical works on a large scale. The last number published, the fourth of volume eight, comprises the description of the species belonging to the genera *Sonchus* (*Sonchus*, *Mulgedium*, *Picridium*, and *Zollikoferia* of modern botanists), *Lactuca*, *Chondrilla*, *Phænopus*, *Prenanthes*, *Leontodon* (*Taraxacum*, Auct.), *Apargia* (the genus

the same as Willdenow's), *Thrincia*, *Kalbfussia*, *Hieracium* (in its widest sense), and part of *Barkhausia*.

Professor Joseph Bertoloni has brought out a second dissertation on the plants of the coast of Mozambique which were sent to him by Cavaliere Fornasini; in this publication 23 species are treated of, 7 of which are described as new.

Professor Parlatore published, in the beginning of last summer, the first part of the second volume of his 'Flora Italiana.' It contains the description of 161 species, divided between 14 genera, belonging to the Natural Order *Cyperaceæ*; amongst them is the *Cyperus Syriacus*, a plant formerly thought to be the *Papyrus* of the ancients, from which the author has distinguished it in a memoir presented to the Academy of Sciences of Paris in its sitting of January 19th, 1852. Botanists will further notice the rejection, not only of the many genera proposed by modern authors and especially by Nees, but also of *Chætospora* and *Isolepis*, which are united with *Schœnus* and *Scirpus*; the reasons for it are given in several interesting remarks on the value of the characters presented by this order of plants. Compared with the preceding volume of this important work, the one before me will be found to contain a much nicer choice of Italian names of plants, great accuracy in the limits assigned to their geographical distribution, and several other improvements.

A short time before the publication of the above-mentioned work, were issued three numbers of the 'Giornale Botanico Italiano,' edited by Professor Parlatore, completing the second volume. This periodical made its appearance in 1844, but owing to various causes it has had a precarious existence. The editor intended continuing it on a new plan, which would have ensured both regularity in its publication, and greater utility for botanical pursuits in Italy; he accordingly had an advertisement and prospectus distributed among the subscribers; but as, unfortunately for science, the number of those who subscribed to this new series was too limited to cover the expenses of publication, all idea of continuing the periodical has been abandoned.

Professor Meneghini has published the second volume of his 'Lezioni orali di Geografia Fisica,' in which are to be found several chapters consecrated to the geographical distribution of plants.

The Accademia dei Georgofili, of Florence, in its sitting of the 5th September last, heard a memoir of the Countess Fiorini of Rome, con-

cerning the *Nostocs* and *Collemas;* the object of which was to prove the identity of structure in both these plants, and that the former, far from constituting a distinct genus of *Algæ*, are nothing but species of *Collema* in a state of imperfect development. The Countess has since that time been continuing her observations, and will no doubt publish them when they are completed.

On the same occasion Professor Amici read a paper on the disease of the vine, refuting the opinion of Bérenger, who in an article published in the journal, 'Il Coltivatore,' asserted that the fungus so destructive to the grapes was nothing but an *Erysiphe*. At the same time Professor Amici exhibited several very fine wax-preparations, representing the fungus highly magnified; they had been executed at the Museum of Florence by order of the director, Cavaliere Antinori, and are now deposited there. Many have been the memoirs, both agricultural and botanical, published in Italy on the disease of the vine during the last two years, the subject being one of the greatest interest to the country, affecting as it does one of its principal products; it is to be regretted however that so many labours have ended in no satisfactory result, neither have agriculturists found a remedy for the evil, nor botanists made us thoroughly acquainted with the cause of it. Amongst the most recent publications on the subject, must be mentioned one of M. Gasparrini of Naples, in which he maintains the identity of *Oidium Tuckeri* with many other fungi thought to belong to distinct genera, such as *Penicillum*, *Alternaria*, *Cladosporium*, *Fumago*, *Trichothecium*, etc.

M. Gasparrini has also produced lately some interesting memoirs on different botanical subjects. For instance, observations on the structure of the bud and fruit in *Opuntiæ*, in which he proves the so-named *adherent calyx* to be of the same nature as the stem, a view supporting the theory on adherent ovaries developed by Schleiden many years ago, and recently brought forward again by M. Germain in his 'Guide du Botaniste.' Another memoir of M. Gasparrini's treats of the tubercles found on the roots of a great many *Leguminosæ*, and thought by some to be distinct organs or even species of Fungi, and which according to him are only a peculiar deformation of the roots.

All the memoirs of M. Gasparrini are to be found in the Transactions of the Academy of Sciences of Naples. The same collection contains a dissertation of Professor Tenore on the *Baccar* or *Baccharis* of the ancients, the conclusion of which is that he thinks the plant so

named by Dioscorides to be the *Inula odora*, by Virgil the *Asarum Europæum*, and by Pliny the *Valeriana saliunca*.

An interesting plant has been discovered by Mr. Panizzi on the calcareous rocks in western Liguria; it is a new species of *Mœhringia* (*M. frutescens*), remarkable for the excessive quantity of oxalate of lime it contains. An account of it has been published by the discoverer.

The only catalogue of seeds that has reached us is the one from the botanical garden of Turin. At the end of it Professor Moris describes a new species of *Dianthus* from Sardinia, under the name of *D. cyathophorus.*

Several foreign botanists have towards the close of last year paid a visit to Italy; thus we have had the pleasure of seeing successively Messrs. Schmidt of Munich, Heufler, Planchon, Ch. Martins, and Webb.

Before concluding, I must mention a fact of great importance to industry in Tuscany, and one which may be productive of benefit to botany,—I mean the Horticultural Exhibition that took place in Florence in September last. It is the more deserving of mention, as it is the first to my knowledge that has ever taken place in Tuscany; it created much interest among us; many gardens, both private and public, contributed to it, especially the botanical garden of the Museum of Florence; a concourse took place, reports were read—which will soon be published—and prizes were distributed: in short, everything went off so well that those who projected this first exhibition entertain hopes of being able to form a Horticultural Society.

Note on the various Vegetable Substances used in India for the purpose of producing Intoxication; communicated by DR. ALEXANDER GIBSON, Superintendant of the Hon. East India Company's Botanic Garden, Bombay.

Adverting to the fact that many notices of Indian and other foreign products are scattered through books of science, or shut up in reports having an interest only local, it occurs to me that it might be of some use to combine in one short notice a few remarks on the various vegetable substances which are used throughout the East for purposes of intoxication.

The extensive use of Opium and Rice Arrack among the Chinese and Malays is too well known to require notice here; also that the Burmese and Mughs are extensive consumers of spirits is a fact equally well known. On this side the Ganges the use of alcohol made from Rice-sugar, Palm-juice in its various states, from the flower of the *Bassia*, from the bark of *Acacia Sundra*, is, if not equally common, at least widely spread. The Rajpoots also, and Kolies of Western India, are great Opium-eaters, and the employment of this drug in rearing children of the most tender age is universal among all classes of Indian society; and from what can be observed there seems every reason to think, not only that the moderate use of the drug is innoxious to children, but positively beneficial, in bringing them through the critical periods of dentition. In the more southern parts of Western India the spirits used are distilled from Palm-juice, from Sugar in its various forms, and less frequently from the cereal grains, whereas north of Bombay and throughout Guzerat and Rajpootana the distillation from the flower of the *Bassia latifolia*, Roxb., is greatly the most common.

This flower is collected in the hot season by Bheels and others, from the forests, also from the planted trees, which are most abundant in the opener parts of Guzerat and Rajwarra. The ripe flower has a sickly sweet taste, resembling manna. Being very deciduous, it is found in large quantities under the trees every morning during the season. A single tree will afford from 200 to 400 lbs. of the flowers. The seed affords a great quantity of concrete oil, used in the manufacture of soap. The forest or Bheel population also store great quantities of the dried flowers as a staple article of food; and hence, in expeditions undertaken for the punishment or subjection of those tribes when unruly, their Bassia-trees are threatened to be cut down by the invading force, and this threat most commonly ensures the submission of the tribes.

In Guzerat and Rajpootana every village has its spirit-shop for the sale of the distilled liquor from the flowers; in the island of Caranja, opposite to Bombay, the Government duty on the spirits distilled (chiefly from this flower) amounts to at least £60,000 per annum; I rather think that £80,000 is most generally the sum. The Parsis are the great distillers and sellers of it in all the country between Surat and Bombay, and they usually push their distilleries and shops into the

heart of the forest which lines the Eastern border and hills of those countries. The spirit produced from the *Bassia* is, when carefully distilled, much like good Irish whisky, having a strong smoky and rather fœtid flavour; this latter disappears with age. The fresh spirit is, owing to the quantity of aromatic or empyreumatic oil which it contains, very deleterious, and to the European troops (Her Majesty's 4th and 17th Dragoons) stationed in Guzerat some thirty years ago, appeared to be quite as poisonous as the worst new rum of the West Indies has generally proved to our soldiers. It excited immediate gastric irritation, and on this supervened the malarious fever so common in those countries. The regimental artificers, musicians, etc., and all whose extra means enabled them to obtain a larger supply of this liquor, were the first to be cut off; but finally the fever spared few or none, and the only effective remedial measure was found to be the removal of the European force to the more sterile semi-desert plains at Deesa, in the north-west corner of the province.

To show how little is known even in India regarding the spirituous drinks of the country, I may state that the question has ere now been gravely entertained by persons high in authority as to the practicability of rendering the people compulsorily sober, by cutting down the wild Date-trees,—as if these were the only source of alcoholic stimulus.

I have before alluded to the *Cannabis* as affording a stimulating material. The use of the plant in its various forms—stalk, juice, and resin—is very widely diffused, and in many provinces (as in Scinde) a draught of the infusion forms a prelude to the daily dinner among the better classes. The stimulus has a champagne-like transience, and is said to whet the appetite and improve the digestive powers. I should here mention that with East Indians liquor, when taken, is most commonly taken before food, and not after eating, as with us.

The continued use of the *Cannabis*, as practised by many at all periods of the day, speedily breaks down the system; the lungs, generative power, etc., all yielding to its influence.

The use of *Nux vomica* is confined to desperate debauchees, by whom it is had recourse to as a bracer-up of decayed corporeal faculties. It is taken to the extent of even two seeds per diem, these being softened and afterwards fried in ghee or butter.

Victoria Regia.

We have long ago recorded the successful introduction of the *Victoria regia* to Trinidad, and we now learn, from a little *brochure* printed and circulated by the Hon. Edward Chitty, of Kingston, Jamaica, that that gentleman has had the gratification of rearing the plant from seed and flowering it in his own garden. A very full account is given of the mode of treating the plant, and of the progress of development; and the author is at some pains to combat a statement made in Chambers's Edinburgh Journal, vol. xiv., viz. "that it is well known to cultivators of the *Victoria* in this country (Great Britain) that it will not succeed in an atmosphere within the influence of the sea-breeze."—We confess ourselves sceptical as to the fact of any experiments having been made with it in England "within the influence of the sea-breeze." Be that as it may, Mr. Chitty finds the sea-breeze to have no injurious effect in his garden, which is certainly within its influence. That gentleman has only seen the accounts of this queen of aquatics published in the 'Botanical Magazine' (before the plant had flowered anywhere in cultivation), and in Chambers's Journal: so that he has dwelt more on the vegetation and growth of it than he would probably have done, had he seen the statements given by Paxton in the 'Gardeners' Chronicle,' etc., and by ourselves in the description from the *living* plants. His observations on the "spontaneous motion of the flower and flower-stalk," first detected by Paxton, are worthy of notice. On the 8th of September, at 6 A.M., he found the apex of the flower as it was the previous evening, pointing to the north-west. As it rose more above the water, it was seen gradually at the same time to wheel round by the west and south, and north to west again; the peduncle, be it observed, was several inches longer than was necessary to elevate the flower to the surface of the water. It had now a spiral twist. On the same day, at half-past 3 P.M., the flower was pointing north-west, and was resting against the last new leaf, which was to the south of it. While inspecting it in that position, it *suddenly* and quickly wheeled round the quarter of a circle, namely from north-west to north-east. On the following day, Dr. M'Nab also being present, the movement was seen again, and it was clearly observed that "the flower rolled itself as a ball upon an axis," in this case from north-east to north. A second flower, while in bud, pointed due north, and suddenly to the

east. On the 14th of September, at 5 A.M., this flower rolled itself to the east, and between that hour and twelve at mid-day it was north again. "We conjecture that, as the flower-stalk certainly becomes spiral, it is that which twists, and, in its contortions, turns and moves the flower from place to place. Its motions backwards and forwards may be akin to those occasioned upon a violin-string by alternate dryness and moisture; but what is the cause under water we cannot conjecture." Mr. Chitty is, we believe, distinguished in Jamaica by the care and attention he bestows upon his garden. Alongside the *Victoria* he cultivates *Nelumbium Jamaicense, N. speciosum,* and vars. red and white, *Nymphæa ampla, Hydrolea, Villarsia Indica, Alisma, Pontederia;* and over the tank a *Sterculia Carthaginensis* casts its broad arms and screens the aquatics from the too powerful rays of the sun. We should strongly recommend that seeds of *Victoria* be thrown into the shallower parts of the ponds or lakes which yield the *Nelumbium Jamaicense:* it could not fail to flourish there.

Nelumbium Jamaicense, P. Browne.

Many persons have expressed their surprise that, common as the *Victoria regia* is in the Igaripes, or still waters which communicate with the rivers in eastern tropical America, it should only of late years have been discovered in localities which had been long much frequented by travellers and even by botanists. We have had occasion to make a similar remark respecting the *Nelumbium Jamaicense* of Patrick Browne, detected and described by that author nearly a century ago as a native of Jamaica: yet it does not appear to have been recognized there again since, till within these six years, as related in the 'Companion to the Botanical Magazine' for 1848. The same species however, as it has since proved, was found plentifully in the southern United States, first by Dr. Bartram. We had then supposed that Jamaica was the southern limit of this species; but we have now the pleasure of stating that our excellent correspondent, T. Bland, Esq., in a visit he lately (1852) paid to the mainland of South America, discovered the *Nelumbium Jamaicense* in full flower and in great abundance in the "Ceirajas between Santa Martha and Barranquilla, New Grenada."

NOTICES OF BOOKS.

WILLKOMM, MORITZ: *Icones et descriptiones Plantarum Novarum criticarum et rariorum Europæ Austro-Occidentalis, præcipue Hispaniæ.* Imp. 4to. Fasc. I. Lipsiæ, 1852.

The present is the first fasciculus of a work intended to include an account, with coloured figures, of the many discoveries that have been made of late years in Spain and Portugal, including also however the south-west portion of France, Corsica, the Balearic Isles, etc. These are undertaken by Dr. Moritz Willkomm, Privatdocent in the University of Leipsic, himself a distinguished Spanish traveller. The work commences with the *Thalamifloræ*, and the group *Sileneæ*, and the present portion is devoted entirely to the genus *Dianthus*, and not here brought to a conclusion. Nine species are described and figured; but not one is considered new, and to our eyes the specific differences would seem very questionable of not a small portion of them. The author's distinguishing phrases (at least they stand in the place of such in other works, immediately following the specific name,—though written in the nominative case) extend in most instances to one-half of these ample pages, and are in reality full descriptions. We trust that the future numbers may present a greater variety, and plants of more general interest than are here discussed. That the materials are ample there can be no doubt, as may be learned by the following extracts from the prospectus.

"Since M. Boissier directed the attention of botanists to Spain, by the surprising results of his exploration of the provinces of Malaga and Granada, which, undertaken in 1837, and embracing only a period of five months, gave rise to the celebrated work, entitled 'Voyage botanique dans le Midi de l'Espagne,' an immense number of new and perfectly unknown plants have been found, and discoveries made, which in Europe seem scarcely possible. Few of the new genera discovered in different parts of Spain, particularly in the south-west, since Boissier's first journey, have as yet had drawings made of them; some even have been but imperfectly, if at all, described, and are not to be found complete in any herbarium in Europe. The same may be said of those discovered in Portugal, France, and the islands before named. In these countries, particularly in the south-west of France and in Corsica, a

considerable number of new plants have been found within the last ten years, which have also, for the most part, not yet been delineated, and of which (like many of those discovered in Spain) but a few specimens exist in the herbariums of France and Switzerland. The rarity of these plants, the difficulty of procuring specimens of them, and the importance which many of them possess when phytologically considered, render them more worthy of a careful description and representation than the plants of any other part of Europe.

"But not only the plants which have recently been discovered in those countries require to be noticed; there are also a number of those well known, partly belonging exclusively to those countries, and partly of such as are native within the circuit of the great Mediterranean Basin, which have never been published at all, or have been represented in an unsatisfactory manner and in works difficult of access, particularly those which have been illustrated only by the old Spanish and Portuguese Botanists; as Ortega, Asso, Cavanilles, Boutelou, Clemente, Lagasca, Brotero, Abbé Pourret, etc. The author is placed in a most favourable position to offer exact descriptions and representations after original specimens of the greater part of these species, inasmuch as the Directors of the Royal Botanical Museum at Madrid, in whose Herbarium the greater proportion of the species made known by the older botanists are to be found, have announced to him that they will place at his disposal duplicates of the original specimens. He has therefore resolved to publish complete and exact representations and description of such new and rare Plants of the South-west of Europe, as have only partially appeared or are not known at all, and he requests such Botanists of Europe, as may have been engaged in the discovery of Vegetation in those Lands, to assist him in the prosecution of his object by tendering any materials they may possess. Among those newly-discovered kinds which will find a place in the 'Icones' the following may be mentioned.

"1. Those new kinds which have been discovered by Mr. Léon Dufour in Valencia, Aragon, and Navarre; by M. Durieu de Maisonneuve in Austria; by Mr. Webb in South Spain and Portugal; by Count Hoffmannsegg and Messrs. Link, Welwitsch, etc., in Portugal. 2. Those new kinds which were discovered by M. Boilieu (Boissier?) in Spain, but which did not appear in his 'Voyage.' 3. Those new kinds discovered by M. Reuter in New Castile and in the Guadarrama Mountains in 1841. 4. Those new kinds discovered by the Author (Wil-

komm himself) in the years 1844, 1845, 1846, and 1850, in Spain and Portugal. 5. Those new kinds found by Dr. Funk in the year 1848 in South Spain, and by M. Bourgeau in 1847, in Catalonia, and since 1849 in Murcia and Granada. 6. Those new kinds described by Messrs. Boissier and Reuter in the year 1849, in South Spain and described in the 'Pugillus,' etc. 7. Those new kinds described by Messrs. Grénier and Godron in the 'Flore de France,' and found in France and Corsica; the new kinds desrribed by M. Jordan in his 'Observations' and found in the South of France, as also all those which might have been published by M. Moquin-Tandon in his 'Flore de la Corse.'

"All these plants will be drawn by the author after the finest and completest specimens, where it is possible in their natural size, in quarto or folio. Correct analyses of the buds and fruit of the plants represented, where it is necessary of the leaves and of the stems, with microscopic delineations; also of the more critical plants, those kinds will be represented on the same plate which may be, and are, taken for the genuine. The plates will be engraved and coloured in the same manner as those of Boissier's 'Voyage.' The Text, in the Latin language, will contain—1. An exact description of the plants engraved. 2. An account of the various similar kinds and the specific differences. 3. Complete lists of Synonyms and of such representations as may already exist, with a critical examination of the latter. 4. An account of the geographical distribution. 5. Explications of the analyses.

Lindley's Folia Orchidacea.

We are glad to announce the second Part of this valuable work, already noticed at page 30 of the present volume. It contains the genera *Sarcopodium*, Lindl., 16 species; *Sunipia*, Buch-Ham., 1 species; *Arcrochæne*, Lindl., a new genus of 1 species, detected in Sikkim-Himalaya by Dr. J. D. Hooker; *Ione*, Lindl., a new genus of 7 species, chiefly Himalayan, from the collections of Wallich, Griffith, Thomson; and J. D. Hooker; *Erycina*, Lindl., a new Mexican genus of a solitary species; the *Oncidium echinatum*, H. B. K., and *Epidendrum*, of which the species (99) of the first five sections are alone included in the present Part; the rest will be given in the third Part.

Notes on Humiriaceæ; *by* George Bentham, Esq.

The collections from Tropical America of Spruce and Schomburgk, having furnished several additional species belonging to the small Order of *Humiriaceæ*, it became necessary, in describing them, to re-examine all the previously known ones of which I had specimens; and as the result has suggested some slight modifications in the characters of some of them, I shall add to the following notes a short Synopsis of the whole Order as far as at present known.

The *Humiriaceæ* were first established as a separate Order by Martius in his 'Nova Genera et Species' (vol. ii. p. 142), who pointed out their general affinity in the first instance with the *Styraceæ* (especially *Symplocos*), and next, though more remotely, with the *Meliaceæ*. Neither the discovery of additional species, nor any of the more recent speculations on the subject, have improved upon the affinities indicated in the above-mentioned work.

The more or less dilated petioles, the form and consistence of the leaves, the cymose inflorescence, and the shape of the flowers, give a peculiar habit to the group, which strikes one at the first glance. On a closer examination it is accurately and readily defined by the short cup-shaped five-lobed or five-toothed calyx, the narrow, slightly imbricated, and very deciduous petals, the stamens more or less united at the base, the filaments much tapered at the summit, the versatile anthers with a thick fleshy connectivum projecting beyond the cells in the form of a cone, the cup-shaped disc or scales round the ovary, and the five-celled ovary with one or two pendulous ovules in each cell and crowned by a simple style terminating in a more or less distinctly five-lobed radiating stigma.

The fruit in all cases where it is known is a drupe, of which the pericarp is often edible, the endocarp forms a hard bony or woody putamen, divided into as many cells as there are seeds developed (for most of the ovules are usually abortive), each seed being attached to the top or near the top of the cell and completely filling the cavity, the testa is thin and brittle, the albumen whitish and almost cartilaginous, the embryo axile and linear, with a rather long radicle directed upwards.

The number of genera, distinguished from each other solely by the number of stamens, remains, as established by Martius, confined to

three, notwithstanding the recent recognition of *Vantanea* of Aublet as belonging to the group. For *Helleria* of Martius can by no means be distinguished from it, a circumstance very likely to have escaped that eminent botanist, since *Vantanea*, owing to Aublet's having overlooked the enlarged connectivum, and to other inaccuracies in his drawing, has until lately been referred to very different families.

These genera may be shortly distinguished by the following characters :—

VANTANEA. *Stamina numerosa* (75 *ad* 150). *Flores majusculi in cymas terminales dispositi.*

HUMIRIUM. *Stamina* 20 (5 *majora interdum triantherifera*). *Flores parvi, in cymas laterales v. subterminales dispositi.*

SACOGLOTTIS. *Stamina* 10 (*interjectis rarius filamentis nonnullis anantheris*). *Flores parvi in cymas laterales dispositi.*

I. VANTANEA, *Aubl.*—*Helleria*, Mart.

Petala elongata. *Stamina* numerosa, basi breviter et irregulariter connata. *Discus* annulatus, integer v. breviter dentatus. *Ovula* in loculis sæpius 2, collateraliter affixa, sed altero a funiculo pendente, in loculo superposita. *Cymæ* terminales, corymbosæ, multifloræ.

1. V. *Guianensis* (Aubl. Pl. Gui. p. 572. t. 229) ; glaberrima, foliis ovatis breviter et obtuse acuminatis, calyce truncato minute dentato (demum fisso), petalis longe linearibus glabris, connectivo loculos vix superante.

On the river Aroura in French Guiana (Aublet), and found by the Schomburgks on the river Cutarè, or western branch of the Corentyn, in British Guiana. My specimen is from a small separate collection of Sir Robert Schomburgk, but I have seen it elsewhere with the n. 982.

Described by Aublet as a tree of 15 to 20 feet, by Schomburgk as "attaining the height of 75 feet, with a circumference, one foot from the ground, of 5 feet, forming a beautiful appearance with its large clusters of red flowers." The leaves are generally about 4 inches long and 2 wide, with a very slightly dilated petiole. The calyx, at first nearly entire, often splits more or less deeply as the flowering advances. The flowers are nearly an inch long ; the connectivum of the anthers is very much smaller than in the rest of the Order, and has been overlooked by Aublet's artist ; it exists however in the usual conical shape,

and slightly protrudes beyond the cells. Schomburgk describes the fruit as a drupe, the putamen of which is furrowed like a peach or apricot, and is by the Indians cut in half and worn round the neck as an ornament.

2. V. *minor*, sp. n.; glabra, foliis obovatis v. obovato-oblongis obtusis, calyce breviter 5-lobo, petalis linearibus ovarioque glabris, connectivo loculos duplo superante.—*Folia* subsessilia, in specimine suppetente vix 2 poll. longa. *Inflorescentia V. Guianensis*, et flores pariter glabri sed minores (7–8 lin. longi). *Calycis lobi* orbiculato-truncati, ciliolati. *Antheræ* parvæ, loculis ad dimidium connectivi attingentibus. *Discus* ut in *V. Guianensi* annulatus, integer. *Ovula* in loculis gemina, collateraliter affixa, altero tamen a funiculo longo suspenso, in loculo superposita.

Gathered by Sir Robert Schomburgk in his last expedition to British Guiana, but not, I believe, generally distributed. It is described as a shrub with white flowers slightly tinged with pink.

3. V. *obovata;* foliis obovatis obtusis retusisve, inflorescentia floribusque extus pubescentibus, petalis oblongo-linearibus, ovario villoso.—*Folia* breviter petiolata, 2–5-pollicaria, coriacea, nitida. *Cymæ* densæ, floribundæ, floribus vix 6 lin. longis.—*Helleria obovata*, Mart. in Nov. Act. Nat. Cur. vol. xii. p. 40. t. 7.

Occurs in various collections from the province of Minas Geraes. It is Gardner's n. 4452.

4. V. *ovalifolia;* foliis ovatis, pedunculis hispidis, petalis tomentosis.—*Helleria ovalifolia*, A. de Juss. in St. Hilaire, Fl. Bras. Mer. vol. ii. p. 91.

From the woods near Bomfin in the Minas Novas, province of Minas Geraes (A. de St. Hilaire). I have not seen this plant. A. de Jussieu says that the flowers of *V. obovata* are precisely the same as in this one, only with a much shorter and scarcer pubescence. Yet the petals of *V. ovalifolia* are said to be "sesquipollicem fere longa;" can this be a misprint for *semipollicem?*

The stamens of *Vantanea* (*Helleria*) are said to be arranged into five fascicles alternating with the petals. I generally find the five outer stamens, alternating with the petals, rather larger than the rest, in all *Humiriaceæ*, but otherwise the arrangement into fascicles is so vague as to be scarcely perceptible in dried specimens, and has been omitted by Martius in his amended character, Nov. Gen. et Sp. vol. ii. p. 147.

II. HUMIRIUM, *Mart.* (a *Houmiri*, Aubl. *mutatum*).

Flores parvi. *Filamenta* 20, basi connata, omnia integra et uniantherifera, vel 5 majora, petalis alterna apice tridentata et triantherifera. *Discus* 10-lobus v. 10-partitus, lobis sæpius emarginatis bidentatisve. *Ovula* in loculis solitaria v. gemina, superposita, dissepimentis spuriis transversis sæpius separata. *Cymæ* pedunculatæ v. subsessiles, axillares v. laterales, rarius terminales.

§ 1. *Filamentis omnibus integris uniantheriferis.—Ovarii loculi nunc biovulati transversim septati, nunc uniovulati.*

1. H. *crassifolium* (Mart. Nov. Gen. et Sp. vol. ii. p. 143. t. 198); foliis amplis obovatis integerrimis crassis ramisque glabris, petiolo alato, cymis subterminalibus latis floribundis, petalis dorso puberulis, ovarii loculis biovulatis.—*Folia* 5–8 poll. longa, 4–5 poll. lata, obtuso-emarginata. *Petala* 2 lin. longa

In the Serra de Arara Coarà, on the river Japurà, in Western Brazil, on the confines of Peru (Martius). A remarkable species from the size of its leaves, only known to me from Martius's detailed description and figure.

2. H. *Guianense* (Benth. in Lond. Journ. Bot. vol. ii. p. 374); puberulum v. glabratum, foliis ovatis obovatisve obtusis, petiolo distincto alato, cymis longe pedunculatis, petalis subglabris, antheris barbatis, ovarii loculis biovulatis.—*H. Surinamense*, Miq. Stirp. Surin. p. 86. t. 24.

Apparently frequent in British Guiana (Schomburgk, 1st coll. n. 270) and Surinam (Hostmann, n. 793, Focke, etc.). Very near to *H. floribundum*, but the leaf-stalk is always much longer, the shape of the leaf rather different, and there is generally more or less of pubescence about the inflorescence and flowers. These, as in *H. floribundum*, are white and about 2 lines long. The fruit is also like that of *H. floribundum*, but rather smaller.

3. H. *floribundum* (Mart. Nov. Gen. et Sp. vol. ii. p. 145. t. 199); glabrum v. parcissime puberulum, foliis obovatis obtusis retusisve in petiolum brevissimum angustatis sessilibusve, cymis longe pedunculatis, petalis glabris, antheris barbatis, ovarii loculis biovulatis.—*H. parvifolium*, A. Juss. in St. Hil. Fl. Bras. Merid. vol. ii. p. 89.

Common in Brazil. The larger form, with leaves 2–3 inches long and 1–2 wide, has been gathered by Spruce in various places along the Amazon and Rio Negro; the smallest, with leaves scarcely one

inch long, grows chiefly along the sea-coast, and several intermediate forms occur in Gardner's and other collections. Among numbered specimens I would refer to this species n. 1263 of Gardner, 2810 of Blanchet from Brazil, and n. 628, 346, 576 of Sir Robert Schomburgk (corresponding to n. 968, 560, and 845 of his brother Richard) from Guiana; the two last numbers indicate a variety with narrower and more elliptical leaves, rather less coriaceous, yet evidently belonging to the same species.

4. *H. montanum* (A. Juss. in St. Hil. Fl. Bras. Mer. vol. ii. p. 90); foliis sessilibus obovatis, inflorescentia folio breviore, pedunculis hirtellis, petalis glabris.

In the district of Minas Geraes, near Itambé (A. de St. Hil.). I have not seen this species, but it must be very near the common *H. floribundum*, of which it is said to have in every respect the flowers, except that they are one-third smaller.

5. *H. obovatum* (Benth. in Lond. Journ. Bot. vol. ii. p. 373); foliis subsessilibus obovatis obtusis retusisve subtus ramulis inflorescentiaque hirsutis, cymis pedunculatis, petalis extus pubescentibus, antheris glabris, ovarii loculis uniovulatis.

In British Guiana (Rob. Schomburgk, 2nd coll. n. 166 and 825, Rich. Schomb. n. 135 and 1359). The leaves vary in size almost as much as in *H. floribundum*, from which this species differs in its hairiness, in the flowers very much smaller (scarcely above one line long), in the stamens only very shortly connate at the base, the ovary globose, somewhat depressed, the style short, and the ovules solitary in each cell, not two together as I had formerly by mistake described them.

6. *H. cuspidatum*, sp. n.; foliis ovatis oblongisve longe cuspidatis serratis ramisque glabris, cymis laxis hirtellis, petalis extus hirtis, ovarii loculis uniovulatis.—*Ramuli* graciles. *Folia* 3–4 poll. longa, 1–1½ poll. lata, cuspide semipollicari, serraturis marginalibus subcallosis, adulta crassa coriacea, petiolo brevi dilatato. *Cymæ* axillares v. laterales, pedunculo compresso fere pollicari floribus quam in cæteris speciebus magis dissitis, pube parca vix nisi ope lentis conspicua. *Flores* 1¼ lin. longi. *Filamenta* glabra, basi breviter connata, omnia integra. *Antheræ* basi brevissime ciliatæ. *Squamæ* hypogynæ 10, distinctæ, emarginatæ. *Ovarium* depresso-globosum, stylo brevi crasso.

Found near Barra do Rio Negro, along forest streams, by Mr.

Spruce, who states it to be a tree of 20 feet, with green sweet-scented flowers.

7. *H. subcrenatum* (Benth in Lond. Journ. Bot. vol. ii. p. 374); ramulis hirtellis, foliis subsessilibus ovatis obtuse acuminatis subcrenatis basi cuneatis, cymis paucifloris, petalis extus puberulis.—*Folia* 1–1½-pollicaria.

I described this from a specimen in Sir W. Hooker's herbarium, gathered by Martin in Cayenne. I have not had an opportunity of re-examining it to ascertain whether the ovary has really one or two ovules in each cell.

8. *H. dentatum* (Casar. Nov. Stirp. Bras. p. 39); foliis breviter petiolatis ovato-lanceolatis dentatis supra glabratis nitidis subtus una cum petiolis pedunculis ramulisque puberulis, corymbis axillaribus folio brevioribus, petalis glabris.—*Frutex* arborescens. *Folia* 3–4 poll. longa, 1½–2 poll. lata, in petiolum 3–4-linearem attenuata. *Stamina* glabra, filamenta vix ima basi inter se coalita.

From the sandy maritime woods called *restingas* in the province of Rio de Janeiro (Casaretto). Unknown to me, but evidently a distinct species.

9. *H.* (Houmiri) *balsamiferum* (Aubl. Pl. Gui. p. 564. t. 225); glabrum, foliis sessilibus ovatis v. ovali-oblongis basi latis semiamplexicaulibus.

Said by Aublet to grow in all the forests of French Guiana. From his figure and description it is evidently very different in the shape of the leaf from any species known to me.

§ 2. *Filamentis* 5 *majoribus cum petalis alternantibus apice tridentatis triantheriferis.—Ovarii loculi uniovulati.*

10. *H. macrophyllum*, sp. n.; glaberrimum, foliis oblongis ellipticisve acuminatis vix crenatis, cymis multifloris pedunculatis floribusque glaberrimis.—*Folia* majora semipedalia, 2–2½ poll. lata, acumine brevi latiusculo, crasso-coriacea, rete venularum parum conspicuo, petiolo 3–6 lin. longo complanato. *Cymæ* fastigiatæ, densifloræ, circa pollicem latæ, pedunculo 1–1½-pollicari, compresso. *Flores* 2 lin. longi. *Filamenta* fere ad medium connata, 5 majora apice trifida, anthera centrali iis staminum simplicium simili, lateralibus paulo minoribus sed pariter locelliferis. *Ovarium* depresso-globosum, ovulis solitariis pendulis.

Abundant by streams and lakes about Barra do Rio Negro, where Mr. Spruce found it growing to a bushy tree of about 20 feet, with highly odoriferous greenish flowers.

11. *H. densiflorum* (Benth. in Lond. Journ. Bot. vol. ii. p. 374); foliis ovato-ellipticis breviter et obtuse acuminatis vix crenatis glabris, cymis pedunculatis, floribus numerosis confertis extus pubescentibus. —*Folia* coriacea, 3–6-pollicaria, petiolo 2–4-lineari. *Pedunculi* subpollicares. *Flores* conferti quasi capitati, fere 2 lin. longi. *Antheræ* laterales staminum majorum quam intermedia minores, loculis parvis v. omnino deficientibus.

On the Rio Quitaro, in British Guiana, Schomburgk, 1st coll. n. 543.

12. *H. oblongifolium*, sp. n.; foliis oblongis breviter acuminatis subserratis glabris v. ad costam minute puberulis, cymis subsessilibus, floribus confertis extus pubescentibus.—*Folia* 4–5 poll. longa, $1\frac{1}{2}$–2 poll. lata, petiolo minus quam in cæteris speciebus dilatato, consistentia vix demum coriacea, venis primariis a costa divergentibus intra marginem arcuato-conniventibus, venulis reticulatis. *Cymæ* pleræque paucifloræ, pedunculo communi vix lineam longo. *Flores* 2 lin. longi. *Calycis* lobi orbiculati. *Filamenta* fere ad tertiam partem connata, glabra, majorum antheræ laterales intermediæ conformes nisi minores. *Discus* irregulariter 10-fissus, lobis denticulatis. *Ovarium* subglobosum, loculis uniovulatis. *Stylus* brevis. *Drupa* oblonga, $1\frac{1}{2}$–2 poll. longa, medio 6 lin. diametro, basi attenuata, apice incurvo-acuminata, subuncinata, carne parca, endocarpio osseo, cavitatibus (balsamiferis?) notato. *Semina* abortu 1–2, singula loculos angustos implentia, testa tenuissima, albumine albido, embryone dimidium seminis superante.

A spreading tree of 30 feet, with greenish flowers and green fruit, frequent in the gapò of the Rio Negro, above Barcellos, gathered by Mr. Spruce in December, 1851.

III. Sacoglottis, *Mart.*

Flores parvi. *Stamina* 10, filamentis dilatatis basi vix brevissime connatis, adjectis hinc inde filamentis nonnullis filiformibus anantheris. *Discus* 5-lobus v. 5-partitus, lobis squamisve sæpe bidentatis bifidisve. *Ovula* in loculis ovarii solitaria. *Cymæ* pedunculatæ, axillares v. laterales.

1. *S. Amazonica* (Mart. Nov. Gen. et Sp. vol. ii. p. 146); glaberrima, foliis oblongis ellipticisve acuminatis, ovario depresso-globoso 5-sulcato.—*Folia* 4–6-pollicaria, leviter crenata, demum crasso-coriacea. *Pedunculi* nunc pollice breviores, nunc 2–3-pollicares, cymis nunc laxiusculis paucifloris nunc amplis dense multifloris. *Flores* fere 2 lin. longi, glaberrimi. *Discus* (squamis bifidis) fere 10-lobus.

This, according to Mr. Spruce, is a common tree along the Amazon, about Santarem and Obidos, on the margins of moist forests, and known to the Brazilians under the name of *Uaxuà*. Martius found it on one of the channels of the same river, and Gardner's specimens, n. 3047, from the province of Goyaz, appear to belong to the same species. The young leaves are of a deep red. The peduncles vary much in length; Martius describes them as of the length of the petioles. I have never seen them so short as that, although they are sometimes not much longer, whilst some are full three inches long. In other respects Martius's description agrees well. The fruit is said to be good eating.

Some of Mr. Spruce's specimens have several of the flowers transformed into ovate coloured leaves, about 5 lines long, so as to give to the cyme the appearance when fresh of a bunch of two or three small double pink roses.

2. *S. Guianensis*, sp. n.; ramulis inflorescentiaque puberulis, foliis oblongo-ellipticis breviter acuminatis, ovario ovato-globoso vix sulcato.

From British Guiana (Rob. Schomburgk, 2nd coll. n. 574, Rich. Schomburgk, n. 842). It is certainly very near to *S. Amazonica*, but besides the leaves being usually shorter in proportion to their breadth, and the pubescent inflorescence, the flowers are considerably smaller, the filaments broader, the disc consists of five nearly distinct truncate scales, and the ovary, scarcely furrowed, is more gradually attenuated into a much shorter style. The fruit is unknown.

The VEGETATION OF THE DISTRICTS SURROUNDING LAKE TORRENS; *sketched by* DR. FERDINAND MÜLLER, *of Adelaide.* (Translated from the German by R. Kippist, Esq., Libr. L.S.) [Read at a Meeting of the Linnean Society, December 21st, 1852.]

"It is a hazardous undertaking to subject the charms of the world of sense to an analysis of their elements."—*Humboldt, Cosmos,* vol. i. p. 9.

If I attempt to sketch in faint outlines the character of the vegetation of the Northern subtropical division of our Colony, it will be much less with the view of crowding together a rich assemblage of large and majestic plants, than with that of pointing out its peculiarities, which, although they offer to the superficial observer for the most part inconspicuous forms, not unfrequently reunite the lost threads of the system, or lead us on in an unknown direction. For although the isothermal lines incline there much further towards the south, than the degrees of latitude would lead us to expect; and although the east coast of New Holland at the same distance from the equator rejoices in the most magnificent vegetative clothing; yet the neighbourhood of the Stony Desert, the Sahara of Australia, with its parching winds, as well as the distance from the sea, equally contributing to the extreme smallness of the amount of atmospheric humidity, counteract the development of the higher forms of tropical vegetation. It is true that the *Malvaceæ*, and together with them the *Cæsalpineæ* and the prickly species of *Solanum*, unmistakeably increase in number towards the north, but these form only a very small part compared with the orders of plants of the same isothermal band under other meridians. But while we may readily account for the want of Mosses and Acotyledones by the extreme aridity of the soil, which is scarcely moistened except by thunderstorms, it remains unexplained why so many other families of plants more or less extensively spread over the most arid steppes of Eastern, and more especially Western Australia, such as *Proteaceæ*, *Epacrideæ*, *Stylidiæ*, *Myrtaceæ*, the simple-leaved *Papilionaceæ*, *Dilleniaceæ*, *Rhamneæ*, *Tremandreæ*, *Büttneriaceæ*, and *Polygaleæ*, either occur so very sparingly or else vanish altogether. It is true that this will least surprise us in the extensive salt plains along Lake Torrens, for these still not only bear traces of their very recent origin, but are even now very little elevated above the surface of the Lake, and, veiled in the delusive mist of the mirage, spread themselves out as if the ocean itself in its

unlimited extent were placed before our eyes. At the same time indeed, in consequence of slight volcanic elevations and the retrogression of the sea-products upon the alluvium, they support only salt-plants; but these perhaps in as large a number as the steppes near Lake Baikal, and for the most part belonging to peculiar species. (*Kochia brachyptera*, *Eriochiton sclerolænoides*, *Osteocarpum salsuginosum*, *Anisacantha bicuspis*, *Blitum atriplicinum*, *Obione spongiosa*, *Atriplex Tandonis*, etc.) Almost equally joyless is the aspect of the suddenly ascending range of hills, rugged as it appears with its jagged, often inaccessible, and often overhanging heights, and abrupt as are the declivities by which it sinks, —here projecting like masses of rock rent asunder, there forming isolated polished cones, but almost always without trees. There are consequently wanting the means of growth for Palms, the labyrinth of parasites, and the interminable contrast of large flowers displaying every variety of colour and of gigantic leaves with the more modest offspring of Flora, which constantly excite our admiration in the tropical world; and there are wanting also, without compensation, the darkly beautiful Pine-forests of the colder climates, interrupted by leafy woods of shadowy Oaks and verdant Beeches!

These mountains, however, little exceed in height the southern hilly-chains of the Colony, and consequently do not develope even the commencement of a subalpine flora, such as may be expected in New Holland only from the yet unexplored Australian Alps, and such as is found in Southern Tasmania. Nevertheless there is found in the loose rubble, which piles itself up especially near the summits, a not inconsiderable number of plants, which seldom or never descend to the salt or stony plains. We sometimes perceive on the walls of rock the aromatic *Eriostemon halmaturorum*, a favourite food of the dwarf kangaroo, which bounds over the clefts of the rocks like a gazelle; sometimes we remark shrubs of *Callistemon teretifolius*, with filiform Hakea-like leaves, and adorned both with yellow and dark red flowers; and again the stately *Trymalium phlebophyllum*, accompanied by a few Ferns (*Notholæna lasiopteris*, and *N. distans*), or the beautiful *Eurybia cardiophylla*, the thorny-leaved *Daviesia notabilis*, occasionally intermingled with common types, such as *Senecio angustifolius*, *Veronica decora*, *Indigofera brevidens*, *Pultenæa leptophylla*, *Phyllanthus saxosus*, *Hovea Beckeri*, *Sida petrophila*, *Sida phæotricha*, *Convolvulus crispifolius*, *Pimelea petrophila*, and *Thysanotus exasperatus*.

Then again among these are seen the rarest forms, *Hemisteirus psilotrichodes*, *Pimelea simplex*, *Picrophyta calcarata*, *Pholidia santalina*, and *Eriosciadium argocarpum*, a quickly perishable Umbelliferous plant, which conceals its small flowers beneath the thick wool of its fruits. With these associates also a fugitive from India, *Trichodesma Zeilanicum*. In the clefts of the barest rocks is found seeking shelter and nourishment the beautiful but poisonous *Isotoma petræa*, for the most part in isolated spots, as well as *Biatora decipiens*, a Lichen of all zones, and *Pomax rupestris*, attaching themselves to the walls of rock.

The valleys, which are periodically converted by thunderstorms into torrents, conduct downwards little rills too quickly drying up, which run through the stony diluvial land, and are recognized at a distance by the band of lofty red-wooded Eucalypti (*E. rostrata*). But rapidly as the water is carried off, there still remains in isolated holes enough for the black native, who lies in wait here for the thirsty emu, and enough also of the element of life beneath the rubble of the river-bed, to give nourishment to a numerous and extremely varied host of plants, as *Malva brachystachya*, *Abutilæa cryptantha*, the magnificent *Hibiscus notabilis*, various species of *Sida*, *Dodonæa lobulata* (a transition-form between the pinnate and simple-leaved species), the creeping *Desmodium Novo-Hollandicum*, the odoriferous *Schizocorona floribunda* (*Cynanchum floribundum*, R. Br.), in spite of its emetic qualities eaten raw as food by the savage natives, the prickly *Solanum lithophytum*, *petrophilum*, and *eremophilum*, *Rostellularia pogonanthera*, and noble Grasses (*Andropogon chrysatherus*, *inundatus*, *Panicum glareæ*, *Chloris Moorei*, *Amphipogon calycinus*, etc.). All these plants, which for the most part indicate an approach to the tropic, penetrate in varied association the gravelly stratum, to root themselves in the moist deposit beneath, and along with them are ranged many related southern species, such as *Loudonia citrina*, *Picrophyta albiflora* (a bitter Goodenia-like herb), *Rutidosis auricoma*, the large-lowered *Senecio megaglossus* and *magnificus*, with other ornamental *Compositæ*, *Prostanthera striatiflora*, perhaps the finest of its splendid genus, Acacias as everywhere abundant and of new and multiform species, *Eyrea rubelliflora*, the *Conyza* of Australia, which bears the name of the courageous discoverer of this region. Sparingly diffused, but far excelling all the other flowers in its incomparable beauty, *Clianthus Dampieri*, the queen of Australian flowers, spreads its long shoots over the gravelly soil; and

in connection with it are found scattered along the chain of hills which surrounds Lake Torrens almost all the rarities which were collected by the companions of Captain Sturt, as *Sturtia gossypioides*, *Petalostylis labicheoides*, *Ixiochlamys cuneifolia* (*Podocoma cuneifolia*, R. Br.), *Cassia Sturtii*, *Cassia platypoda*, rarely varying, like some other species with undeveloped foliola (*i. e. Cassiæ phyllodineæ*, R. Br.), and united with new species (*C. desolata*, *C. teretiuscula*), together with the precious *Eremophilas*, which run into the species of *Stenochilus* through *E. latifolia*. Among the rarest are a small tree *Capparis* (*C. Mitchellii*), a Cucurbitaceous plant, the scented *Didiscus glaucifolius*, and the disagreeably bitter *Gyrostemon pyramidalis*, the latter at a distance bearing a nearer resemblance to a dwarf Pine than to the other species of its genus. More frequent than the plants just mentioned, but equally in groups of trees, occurs *Acacia Salix-tristis*, with its twigs descending to the earth, a counterpart of the weeping-willow, while *Gyrostemon acaciæformis* imitates the growth of the black-wooded species of *Acacia*.

The plants which extend over the undulating low lands between the ranges of hills, accord in great degree with the scrub of the calcareous shore of the Upper Murray; we meet once more with the same leafless bushes of *Daviesia egena*, *Exocarpus leptomeroides*, imposing masses of the feather-awned *Stipa elegantissima*, Jasmine bushes, Sandal-trees loaded with fruits, *Myoporum platycarpum*, *Pittosporum acacioides*, large bushes of *Eremothamnus myoporoides*, nauseously bitter like *Pittosporum* and many other plants of the same Order, a property in which the slender *Pholidia scoparia* likewise participates. In vain however might we seek along the high calcareous lands of the Murray, after rarities, which even here reward the toils of the naturalist. New species of *Zygophyllum* connect themselves with those already known, and pass insensibly into the *Rœperas*. Through certain species of *Cruciferæ*, *Craspedia plejocephala*, *Pteropogon ramosissimus*, *P. platyphyllus*, *Festuca bilobulata*, *Tetragonia inermis*, *Glossogyne bidentidea*, *Trichinium variabile*, *Waitzia brachyrhyncha*, *Helipterum chionolepis*, *Euphorbia deserticola*, *Abutilon diplotrichum* and *halophytum*, either the limits of old established genera are extended in a surprising manner, or we recognize in them new links, serving to connect species but slightly allied, or to unite genera artificially separated.

The more monotonous the general aspect of these extended plains, the more cheerfully do we greet every oasis in them. A more gentle

slope of the hills, or a deeper inclination of the plains, occasion a lasting accumulation of water, and with it a luxuriant verdure of the turf; the Callitris-trees increase, and with them, nutritious plants, about which the scattered flocks of sheep and cattle assemble from the salt-marshes.

Further delineations would lead me too far beyond the limits of this sketch; but what I have here pointed out, as constituting the physiognomy of the northern Flora, may be sufficient to show, that we can scarcely venture to receive quite unconditionally the judgement of the distinguished R. Brown on the physical character of the vegetation in these districts, still less on the display and analysis of its details. The plant-world here, scanty indeed in species, is indemnified by the richness of the masses, by the variety, and even by the profusion of many forms, which, it is true, are not always brilliant. The great *savant*, who half a century ago published the earliest scientific notices of this part of the country, visited cursorily a few widely separated points of the south coast, and that too at the most unfavourable season: neither have I had the opportunity of fully exploring this neighbourhood; yet I feel assured, that at a later period, and when more readily accessible, it will greatly enrich our collections, and thus mitigate the sentence as to its paucity of plants.

The Fixed Vegetable Oils of Southern India.

The following interesting particulars have lately appeared in the 'Madras Athenæum,' for September 28, 1852: and when we consider the enormous consumption of Vegetable Oils, Waxes, and Tallows, for candle-making and a variety of other purposes, we cannot too highly appreciate the importance of such a communication as that of Dr. Alexander Hunter.

"The list of oleaginous products common to the Madras Presidency is unequalled for variety and excellence. It embraces almost every oil known to commerce, and under a wise administration might be made equal to the supply of the whole world. In the majority of instances the raw material requires neither skill nor care in the growing, and can be reared in most cases on any kind of soil. If the state of things under which we lived was favourable to the employment of English

capital, there is no branch of trade which would increase more rapidly, or yield larger returns, than the manufacture of Oils in Southern India.

"It will be seen that Dr. Hunter's estimate of the prime cost of the inferior native article in the Bazaar, averages much more than Rs. 3 per Madras maund, or upwards of £30 a ton. If we add to this the price of casks—four and a half of which, costing £3. 3*s*., go to a ton—freight £4, an *ad valorem* duty, the expense of purchase and shipping, and charges in England, it will be found impossible to lay down oil, with profit, at less than £45 per ton. The present rates in the home market for Gingelie and Ground-nut Oils are more than 20 per cent. below that figure, with not the slightest chance of improvement.

"We have not space in our present issue for those statistics which Dr. Hunter calls for, and which we are luckily in a position to furnish. He will be very glad to hear, that they disclose a far more prosperous state of things than his information had led him to calculate upon.

"*Letter from Dr. Alexander Hunter.*

"The following are some of the Fixed Oils of India, regarding which it would be desirable to get information as soon as possible. The prices at which the oils can be manufactured in different localities ought to be specified; and, if possible, particulars should be furnished regarding the process of preparation, as some oils are procured by expression from fresh seeds, others by boiling and separating the husk, or by steeping and subsequent exposure to the sun before the seeds are put into the mill. The purity of oils, and consequently their therapeutic, dietetic, and commercial value, depend greatly upon the care and cleanliness followed in their preparation. As a general rule, the fresher the seed and the more rapid the process of expression, the purer will be the oil. Rancidity and discoloration are often produced by too much boiling, or by crushing the seeds in a dirty mill, in so large a quantity at a time that the oil cannot be expressed from the mass before putrefactive decomposition has commenced. Strong smell or aroma may depend upon the age of the seeds, and their partial decay, or upon the presence of husks, pods, or impurities. It is advisable that suggestions of this kind should be given to the manufacturers of Indian oils, as there is considerable difference in the quality of the same oils from different districts.

"OILS OF INDIA.—(FIXED.)

Country Almond oil	*Terminalia Catappa.*
Castor oil	*Ricinus communis.*
Cocoa-nut oil	*Cocos nucifera.*
Coloquintida-seed oil	*Cucumis Colocynthis.*
Cucumber-seed oil	*Cucumis sativus.*
Gingelie oil	*Sesamum orientale.*
Ilpa oil	*Bassia longifolia.*
Jamaica Yellow Thistle oil	*Argemone Mexicana.*
Coarse Castor oil	*Ricinus communis.*
Lamp oil, refuse of ditto	*Ricinus communis.*
Margosa oil, 5 species	*A. Indica, Azadirachta.*
Mustard-seed oil	*Sinapis Toria.*
Mustard-seed oil	*Sinapis Chinensis.*
Mustard-seed oil	*Sinapis glauca.*
Mustard-seed oil	*Sinapis nigra.*
Physic-nut oil (a lamp oil)	*Jatropha Curcas.*
Glaucous-leaved Physic-nut oil ...	*Jatropha glauca.*
Pinnay oil	*Calophyllum Inophyllum.*
Poongum oil	*Dalbergia arborea.*
Safflower-seed oil	*Carthamus tinctorius.*
Downy Mountain Ebony..... ..	*Bauhinia tomentosa.*
Thorny Trichilia Ebony	*Trichilia spinosa.*
Wood oil	?
Poppy-seed oil	*Papaver somniferum.*
Ground-nut oil	*Arachis hypogæa.*
Cashoo-nut oil	*Anacardium occidentale.*
Marking-nut oil	*Semecarpus Anacardium.*
Cheeronjee berries and seeds	*Chironjia sapida*, now *Buchanania latifolia*
Saul-seed oil	*Shorea robusta.*
Valuse oil	*Guizotia Abyssinica.*
Ram-til or Valisoloo oil	*Guizotia oleifera.*
Poon-seed or Oonde oil	*Calophyllum.*
Kurrunje oil	*Pongamia glabra.*
Country Walnut oil	*Aleurites triloba.*
Hingum or Hingota oil	*Balanites Ægyptiaca.*

Mooneela Grain oil	*Dolichos biflorus.*
Vegetable butter	*Bassia butyracea.*
Epei oil	*Bassia latifolia.*
Piny oil or Vegetable tallow	*Vateria Indica.*
Kokum oil	*Garcinia purpurea*
Kikuel oil	*Salvadora Persica.*
Vegetable wax	*Gutta podoh.*
Coorookoo oil (from Madura and Tinnivelly)	*?*
Koodree oil	*?*
Kaisoon oil (from Chota Nagpore)	*?*
Shermandee oil (from Palamcottah)	*?*
Khatzum oil	*Vernonia anthelmintica.*
Cotton-seed oil	*Gossypium herbaceum.*
Wound oil	*A mixture of two or three pale oils.*
Neereddimootoo oil or Neeroodoo oil (from Cuddapah)	*?*

"The above list of Indian Oils had been prepared for publication, and was just going to be sent to press when a basket containing samples of twelve different oils was received for the Indian Exhibition from E. F. Crozier, Esq., Vizianagrum. Some of the oils were of very fine quality, and far superior both in smell and colour to the same kinds of oil procurable in the bazaar at Madras. Three of the oils could not be identified, and a letter of thanks was immediately despatched, requesting that leaves and seeds of the plants, which yield the different oils, might be forwarded by banghy as soon as convenient. In the course of a fortnight, a parcel was received containing fresh leaves and seeds of most of the plants, with some interesting remarks regarding a few other leaves used in medicine by the natives, and of which samples were sent. The mistake however had been committed of packing up the leaves in their damp fresh state, instead of drying them by gentle pressure for a few days between folds of common paper. The consequence was that all the leaves became black and mouldy, the moisture from them also obliterated some of the written names. The oil plants however were all identified, and only one of the medicinal plants could not be made out. The following were the oils received :—

TAMIL NAMES.	ENGLISH AND LATIN NAMES.	REMARKS.
Nervalum unnay	Croton oil .... *Croton Tiglium*	Very clear, colour dark brown.
Kudaghoo unnay	Mustard-seed oil .... *Sinapis Toria*	Flavour pungent, smell fresh and strong, colour pale.
Eloopie unnay	Ilpa oil .... *Bassia longifolia*	Partially decomposed; this is a solid oil that will not keep long.
Valisaloo unnay	Ramtil oil ... . *Guizotia oleifera*	Colour clear, straw-yellow, little smell.
Vay pum unnay, No. 1.	Margosa oil, No. 1. ...... *Azadirachta Indica*	Colour of pale sherry, smell strong, disagreeable.
Vay pum unnay, No. 2.	Hill Margosa oil .... *Melia Azedarach*	Colour of amber, smell very strong, like bad meat.
Pyratie cottay unnay .	Cotton-seed oil .... *Gossypium herbaceum* ...	Colour of claret; this is a drying oil.
Cangoo unnay, No. 1, or Kurrunje ka tel .	Cangoo oil, No. 1. .... *Pongamia glabra*	Colour of pale sherry, little smell.
Cangoo unnay, No. 2, or Poongum unnay	Poongum oil .... *Dalbergia arborea*.........	Colour of dark sherry, smell strong.
Brumnadundoo unnay, or Bulruckasee	Jamaica Yellow Thistle... *Argemone Mexicana*	Colour pale yellow, like Linseed oil, very little smell.
Nul unnay...............	Gingelie oil .... *Sesamum orientale*	Quality very fine, smell faint, like fresh butter.
	Wound oil	A mixture of some clear oils.

"Of the above oils, a few are deserving of particular notice.

"The *Mustard-seed oil* is clear, pungent, and limpid, retaining a great deal of the flavour of the fresh seed; it is used by the natives in cookery, and externally as a rubefacient; the price is Rs. 3 per maund of 25 lbs.

"The *Ilpa* and *Epei* oils, which are the produce of the seeds of the *Bassia longifolia* and *B. latifolia*, are very similar in their appearance and properties. They are both solid oils at moderate temperatures, and have a fresh pleasant smell when first drawn: they only retain this for a moderate time, and begin to decompose in the course of a fortnight or three weeks during warm weather, emitting a rancid smell, and separating into a muddy-brown and a clear liquid, the former being the most copious, and falling below the other. These oils can be kept for a long time in a cold climate without undergoing change, and may be preserved for a few months in India by being securely corked and ex-

cluded from all contact with air. They are used by the natives for the manufacture of soap, and for burning in lamps. They are in request in Great Britain for the manufacture of candles, and might also be used extensively in the process of spinning and cleaning wool and cloth. Their price in the North Division is Rs. 3–8 per maund.

" *Ramtil* or *Valisaloo* oil.—This is a good clear pale oil, with very little smell; it is attracting attention in the European market from its being suited to a good many manufacturing purposes; the price is Rs. 3 per maund.

" *Margosa* oils.—There are five varieties of the Margosa-tree in the N. Division, each of which yields seeds from which an oil can be expressed. The common species of Neem and the Hill Margosa or Vaypum yield oils possessed of nearly similar properties and having a strong disagreeable flavour, resembling that of cooked bad meat. These oils are used as external applications for eruptions and to keep away flies and insects from abrasions, itchy eruptions, or ulcers on the skin of man or animals; they are also used as rubefacients, and are said to be good applications for broken knees in the horse. They are sometimes used as lamp-oils. Price Rs. 3–4 per maund.

" *Cotton-seed* oil.—This is said to resemble Linseed oil in its working qualities; it is darker in colour, but appears to be a good oil. Price Rs. 3 per maund.

" *Cangoo*, *Poongum*, and *Kurrenje* appear to be all varieties of the same oil, procured from the seeds of the *Dalbergia* and *Pongamia.* They are good clear oils, bearing considerable resemblance to Linseed oil both in colour and smell. Price Rs. 3 per maund.

" *Bulruckasee* or *Jamaica Yellow Thistle* oil is pale, clear, and limpid, with hardly any smell; it appears to be a good useful oil. Price Rs. 3 per maund.

" *Gingelie* oil.—There is perhaps no oil in India which differs more in quality than this, according to the method of preparation: in most bazaars it is a strong-smelling, rancid oil, with a very offensive taste, but when care and cleanliness are observed in the preparation it is a pleasant sweet oil. The seeds are now largely exported from the North Division for the purpose of manufacturing salad oil or substitutes for it. The native methods of preparing oils are so slovenly and careless, that European manufacturers find it to be more advantageous to import the raw seed and prepare the oils for themselves. The sample of *Gingelie*

oil forwarded is certainly a near approach to the fine Olive oil of Europe. Price varying from Rs. 2–8 to Rs. 5–12 per maund.

"Another letter has just been received from Mr. Crozier, intimating the despatch of some more contributions for the Exhibition, and of some medicinal plants, minerals, gums, etc. The process of preparing *Wound* oil is also described, and will be noticed hereafter as soon as the plants employed in the process are identified by the Professor of Botany. The demand for the oils of India is steadily on the increase, and it is desirable that every means should be used to give publicity to the subject, as there are several manufactures in which the solid fatty oils of India might be advantageously substituted for Tallow, Wax, or Spermaceti; some of the fine oils of this Presidency might also be brought more extensively into use if more were known about their quality, colour, smell, and price. Experiments are being tried with some of the Indian oils, and any information or specimens will be thankfully received and acknowledged."

On the Botany *of the* North-western District *of* Western Australia.

[At p. 188 of our last volume we announced the safe return to Swan River of the venerable James Drummond, from a long and interesting tour of eighteen months' duration, to the northward of that river. We have now the pleasure of giving some account of the botanical success of that tour. Of the plants themselves we cannot speak till their arrival, which is almost daily expected.—Ed.]

The Swan River district and the country south between the Swan and King George's Sound, Cape Riche, and as far to the east as Middle Mount Barren, have been partially examined, many new plants found, and an account of them published in various botanical publications, but as yet little is known of the botany of this colony to the north of the Moore River.

Having lately travelled from the Moore River to the Murchison (latitude $27\frac{1}{2}°$ south), and taken several excursions to the east and west of Dundaragan, I send you some account of the plants I met with, premising that I shall principally confine my observations to

plants which I suppose belong to new, or to such species of known, genera as may be interesting to botanists for their rarity, to florists for the beauty of their blossoms, or to the public generally as characteristic of the country, beginning with the largest Australian Natural Order, the *Leguminosæ*.

The country in the vicinity of Dundaragan, and near a spring called Palimarra, about twenty miles to the north-east, produces a remarkable *Acacia*, which grows to be a large tree with a trunk three feet in diameter; this species comes near the common Manna in botanical character, but the leaves are longer and narrower, and the seeds are much smaller; the tree produces large quantities of a gum called *badjon* by the natives, and which forms the principal article of food for them during the dry season. Another new species of *Acacia*, also allied to the Manna, but with broader and shorter leaves, grows in the York gum forests, on the hills to the north of Dundaragan. The fine park-like scenery of the Bowes River district is principally produced by a species of *Acacia* closely resembling the common green wattle, but the leaves are greener, and the seeds and seed-vessels very different; the tree grows in groups or clusters, spreading by the roots; this species is slower in growth, and lives to a much greater age, than the green wattle.

Acacia cyanophylla, and a *Labichea* with imparipinnate leaves, grow on all the limestone hills to the west of the Valley of the Lakes; this latter is perhaps the *L. diversifolia* of Meisner, in the 'Plantæ Preissianæ,' but if so it is a very different species from the *L. lanceolata* of Bentham, which Meisner supposes to be a variety of it.

I observed, also belonging to the division of *Leguminosæ*, two fine species of *Cassia*, one with large glaucous imparipinnate leaves, another with similarly formed leaves, but having green leaflets ending in sharp points; both species grow on the Murchison. A species of *Oxylobium* with trifid leaves and flowers of a pale rose-colour when they first come out, but they soon change to white—a rare colour in Australian *Leguminosæ*—grows abundantly by the road-side, about half a mile to the south of the salt springs called Colbourn by the natives. A very remarkable *Jacksonia*, with large and curiously-branched phyllodia, growing in whorls, and bearing flowers in heads, is seen in abundance in a valley among the ironstone hills about four miles to the northward of Dundaragan. A very curious *Daviesia*, with broad plank-like leaves

repeatedly branched in the form of a stag's horn, grows on Mount Lesueur and other hills of Gardener's Range; the flowers were past in September; the seed-vessels found on the plant were like those of *Daviesia*, but larger than they usually occur in the genus. Two fine species of *Sphærolobium*, one with orange-red flowers, larger than those of *S. grandiflorum*, and a small species with beautiful purple flowers, grow on the ironstone hills to the north of Dundaragan. The York gum forests, on the high ground to the east of the Hill River, produce a narrow-leaved *Gastrolobium*, which bears a considerable resemblance to the plant called "Wall's Poison," growing near York, and I fear it too closely resembles that plant in its properties; it is however a distinct species, being altogether a smaller plant, with much smaller flowers. Another new *Gastrolobium*, which comes nearer *G. ilicifolium* than any described species, is found on the top of the ironstone hill half a mile to the east of Colbourn springs; the leaves have fewer and deeper divisions and the sinuses are armed with curious recurved prickles. *Mirbelia pulchella*, an elegant little plant, with bright blue flowers, which sometimes vary to white, grows abundantly on the ironstone hills to the north of Dundaragan. Two new species of *Hoveæ*, one nearly allied to *H. pungens*, but the leaves are only about half the length, and much broader towards their footstalks, I saw on the top of the ironstone hills to the east and west of the Colbourn springs; and another species with linear hairy leaves (all the known species of the genus have blue or purple flowers) on the ironstone hills near where the road approaches the first tributary of the Hill River.

I met with a beautiful purple-flowered, sweet-scented *Lotus*, first on the banks of the Irwin, and afterwards in much greater abundance by a spring near Mount Hill; here the plants covered several acres, growing as close together and as luxuriantly as a cultivated bed of lucerne; it is an herbaceous plant, much resembling some of the larger varieties of *L. corniculatus*. The purple *Lotus* is a favourite food of sheep, cattle, and horses. The banks of the Greenough and Irwin rivers produce a new genus, allied to *Trifolium* and *Melilotus;* it is an annual plant, a foot or eighteen inches in height, the leaves are the size and shape of the common red clover, the flowers are sessile, borne in clusters in the axils of the leaves; they are of a yellow colour, and have a strong scent of the officinal *Melilot* when dried; the seed-vessels are flat pods about an inch long, opening at both sides to discharge the

seeds, which are small, like the cultivated lucerne. I observed a new species of *Psoralea* on the flats of the Irwin, with long spikes of small purple flowers; the leaves are trifoliate, larger than those of red clover, and wrinkled; it is a favourite food of cattle and horses. The rare *Cyclogon canescens* of Bentham grows abundantly on the Hutt, and I saw two additional species of the genus on the Irwin and the Murchison; the species on the Irwin is a prostrate plant, much resembling native plants of *Vicia sativa;* the flowers were past, and the seed-vessels are those of *Cyclogon;* this plant appears among warren-holes, where the road first approaches the species; on the Murchison it grows about a foot high, bearing shorter spikes of flowers than *C. canescens,* but the flowers are much larger and finer than they are in that species; the seed-vessels resemble *C. canescens* in form.

(Natural Order *Chrysobalanaceæ*).—A species of *Stylobasium*, probably the original species of Desfontaines, grows on all the limestone hills to the north of the Valley of the Lakes.—The Natural Order *Myrtaceæ,* Suborder *Chamælauciæ,* produces many fine species over the whole of the country examined to the north and west. A pretty species of *Genetyllis,* growing about a foot high, with short, fleshy, decussate leaves, occurs plentifully on the sand-plains to the east and west of the Hill River; the barren shoots are numerous, growing close together and quite upright, about a foot high; they are generally unbranched and form a sort of column; the flowering branches are about the same length, much branched, and they lie close to the ground, spreading themselves in all directions round the plant which produces them; the involucres are rose-coloured, about an inch wide at the top, and as much in depth; these cups grow quite upright, sometimes more than a hundred of them are seen on the ground, in a circle round the column of barren branches, and unless the plants are carefully examined there is nothing to indicate their connection, the flowering branches generally shoot out below ground. Another pretty species of this genus grows about a foot high, with heath-like leaves; the drooping heads of the flowers are surrounded by glabrous bracts of a deep rose-colour. Two more new species of *Genetyllis* are found with small heath-like leaves and small bracts. The genus *Chamælaucium* produces several fine species. By far the largest shrub of the Order known to me is found on sandy ground near all the rivers, from the Moore to the Irwin; it grows from fifteen to twenty

feet high, bearing numerous corymbs of large lilac flowers: the sepals are broad and very short, without cilia; the style bearded, and young plants of this fine shrub, about five or six feet high, often appear to have corymbs of flowers four or six feet in diameter, but these corymbs are produced by several branches.

A very beautiful *Chamælaucium* is found on both sides of the road on the border of the sand-plain, about half a mile to the south of the Colbourn springs; it grows about two feet high, bearing its flowers in round head-like corymbs; the flowers are about the size of those of *Verticordia insignis;* they are white when they first come out, becoming rose-coloured with age; the calyx and all the leaves of the plant are strongly ciliated. I met with a curious little plant of this Order, either a species of *Chamælaucium* or a new genus nearly allied thereto; it grows about eighteen inches high, and is a slender shrub with small heart-shaped leaves; the corolla is lengthened into a sort of tube, like an Epacrideous plant.

The splendid genus *Verticordia* produces several fine new species. The large scarlet *Verticordia,* which I call *V. grandis,* first appears on the sand-plains to the east of the Hill River; but it is seen in the greatest perfection on the sand-plain to the north of the spring called by Mrs. Brown the "Diamond in the Desert;" it grows to be about five or six feet high, with glaucous, round, and rather fleshy leaves, about half an inch in diameter; the flowers are seen in their greatest beauty the second or third year after the plants have been burned down; it is then from two to three feet high, throwing up many stems from the same root, and one mass of scarlet flowers; the principal branches are covered for more than a foot of their length, and these throw out many smaller shoots, which are also covered with flowers. I found another species of *Verticordia* with leaves in shape and size like the *V. grandis,* but thinner in substance. The whole plant, although growing to the same height, is of very slender habit, and is found thinly scattered over the great sand-plain between the Hutt and the Murchison; the flowers are of a lilac colour, and appear to have five blood-red spots in each; these are produced by the undivided part of the calyx, which is of a very dark red colour, and is visible through the almost transparent corolla. This plant, when well grown, that is, flourishing in open places, and not injured by other stronger plants, has every one of its numerous slender branches loaded with

flowers, and in that state it may contest the prize of beauty even with *V. grandis* itself.

A new lilac-flowered *Verticordia*, with glaucous, heart-shaped, indented leaves, with several unbranched stems from the same root, which terminate in small corymbs of flowers, appears sparingly about nine miles to the north of the Hill River, and also near the base of Mount Lesueur; and I have seen specimens which were gathered by Mr. Edward Whitefield, near his residence on the Moore River; this is one of the rarest species of the genus. A new *Verticordia*, growing five or six feet high, with heart-shaped leaves and drooping corymbs of yellow flowers, grows abundantly on the sand-plain to the northward of the Hutt River. Another beautiful yellow species, attaining twice the height of *V. grandiflora*, with larger flowers and longer leaves, and without the hairs which grow on the stem of one variety of that plant, and differing from both varieties in growing to a much larger size, is found on sand-plains near the Smith River. I have several other supposed new species of *Verticordia*, but they require to be compared with others in my herbarium.

Calycothrix produces several new species, with both purple and yellow flowers, but the characters which distinguish the species of this beautiful genus are so minute I cannot describe them in a communication of this kind. The only species I shall particularly notice is one which grows in form of a pyramid; the plant rises about two feet high and is about a foot wide near the ground, tapering up to a point; the leaves are small and heath-like, the branches crowded as thick as they can grow together; the outside of the pyramid is one mass of purple flowers, which almost hide the leaves. This curious and beautiful plant I saw in abundance near the spring called the "Arrow Well."

Of Labillardière's genus *Pileanthus* I gathered two species, and I saw a portion of a third, which was brought by my son, James Drummond, from the Upper Irwin. The first is a species with large purple flowers, growing in corymbs, not unlike a purple Sweet-William. This species grows on the limestone hills to the north of the spring Diamond of the Desert; the other species I met with has red flowers, it is near one I found on the Wanjan Hills, but the flowers are smaller and more numerous in the heads, and the habit of the plant is different; the species I saw from the Upper Irwin has heart-shaped leaves and orange-coloured flowers.

The Subtribe of *Myrtaceæ*, *Leptospermeæ*, produces but few new species to the north; among those found are three species of *Hypocalymma*. A yellow-coloured species, growing from eighteen inches to two feet in height, with leaves about an inch long and quarter of an inch wide, first makes its appearance on the sand-plains and ironstone hills near Dundaragan, and I saw it in abundance in similar situations as far to the north as Mount Lesueur; it produces abundance of fine yellow flowers in the axils of the leaves. A narrow-leaved plant like *Hypocalymma angustifolia*, but growing sparingly near the Diamond Spring, and a white-flowering and robust-growing species, five or six feet high, with leaves of the size and form of the broad-leaved yellow species, are abundant, but only in one spot, a small valley among the hills, about four miles to the north of Dundaragan. A square-capsuled opposite-leaved *Eucalyptus*, not yet seen in flower, grows among the hills near Dundaragan; and a beautiful yellow-flowered *Eucalyptus* grows on the limestone hills to the West of the Valley of the Lakes: it grows to a tree from twenty to thirty feet high, the leaves resemble those of the Red-gum, they are hispid on the young shoots, glabrous on the flowering branches, they are always opposite in vigorous growth, sometimes alternate on old stunted trees; the cups are of a bright scarlet colour, and have a verrucose appearance; when the capsule expands in a quadrangular form, the angles carry with them the stamens in four divisions; the seed-vessels are nearly as large as those of the Red-gum. The scarlet cups, fine yellow flowers, and opposite shining leaves of this tree make it one of the finest species of the genus.

A beautiful species of Dr. Lindley's genus *Erema*, but departing in some degree from the generic character in having flowers borne in clusters of four together, of a beautiful scarlet colour, and with buds covered with a soft wax-like substance before they expand. A *Calothamnus*, with lanceolate leaves, about three inches long and about a quarter of an inch wide, bearing bright scarlet flowers, followed by verrucose seed-vessels, grows on the sand-plains between Champion Bay and Mount Fairfax, and near the road in several places more to the south.

The Natural Order *Rutaceæ*, or Rue-family, is not common in the country passed over, but I met with two plants which I suppose belong to new genera; one is a small shrub, about two feet high, with round hoary leaves about half an inch in diameter; the flowers have no

calyx; they consist of five petals, which expand in a star-like form; they are of a greyish-green colour outside and pure white inside; they soon fall off and leave only the two-celled capsules; the cells are placed opposite, with lengthened recurved points; they each contain a single seed; this plant grows sparingly by the side of a watercourse on the east side of Mount Lesueur. The other plant, which I suppose belongs to a new genus of this Order, is a stiff upright-growing shrub, about two feet high; the flowers are borne in corymbs from nine inches to a foot in diameter; they are not very conspicuous, but are accompanied by numerous large bracts of a golden yellow colour, which render this one of the most showy of our native plants; it appears on sand-plains to the east and west of the southern branch of the Hill River, and in other similar situations to the south of the Irwin River.

A new *Euphorbia* is found among the warren-holes on the Irwin; the leaves are linear, about an inch long; the stems grow from eighteen inches to two feet in height.

(*To be continued.*)

BOTANICAL INFORMATION.

The VEGETATION OF NORTH GREENLAND; *translated (by* Miss Gurney) *from 'The Danish Districts in North Greenland, their Geography, Produce,' etc., by* H. Rink. Copenhagen, 1852.

We have mentioned the ridge along the south-west side of Omenak's Fiord, the plateau of which is at the height of nearly 6000 feet, as instructingly displaying the gradual decline of vegetation in the same ratio with the increase of snow and ice. From Karsok-ness a regular slope, with two distinct prominent terraces, leads up from the strand to the ice-covered plateau, to a height of about 5000 feet, the whole distance being a mile and a quarter. The small quantity of snow which falls here compared with that on the other side of the peninsula, and the long time the ground is therefore uncovered, allows the vegetation to reach higher limits than in other places, and the land here rises to fully the usual height. We will therefore shortly describe how we found this tract on the 30th of July, 1851, in a summer of very cold

unsettled weather. The first ascent is composed of low granite banks, overgrown with the usual creeping bushes, *Empetrum*, *Andromeda*, etc., interspersed with green patches of grass and moss, and with swampy places. Across a plain overspread with boulders brought down by the River Karsok, you come to a steeper terrace-like ascent, forming the foot of the Trap stratum, which occupies the rest of the mountain. The upper part of this terrace is at a height of 1000 feet, and here in the clefts of the rock appear seams of coal passing into graphite (black lead?).

The clouds often rest upon the whole of this terrace, and in August and September it generally happens that when it clears up after rain and snow the whole remains covered with snow, whilst below there has been only rain, or the snow has melted as it fell. Up to 2000 feet there is no great change. The soil is alluvium and gravelly, and bears a thick covering of vegetation, consisting of the same plants as on the lower land. In some clefts there are detached masses of ice, which seem to have been produced by snow, and to have lain for many years, but are not observable from below. Between 2000 and 3000 feet up, the uniform carpet of vegetation becomes thinner, the Grasses, Sedges, and Lichens which formed the mass of it are replaced by green moss, which at the height of 3000 feet still covers the swampy spots with the freely-flowering *Ranunculus nivalis*. At the height of 3900 feet, by measurement, the vegetation is no longer continuous, but plants are dispersed about the gravelly soil, and the swampy parts barren. Here the willow, *Salix glauca*, disappears, and we find little heaps of hard icy snow, traces of reindeer, and many of their shed horns are now to be seen. The patches of snow become thicker, and at about 4500 feet we reach the edge of the permanent ice and snow. Amongst these heaps of old snow, and by the edge of this highland ice, the following plants, as determined by the botanist Dr. Pauli, were gathered:—*Papaver nudicaulis; Potentilla Vahliana; Saxifraga tricuspidata, S. oppositifolia, S. cæspitosa; Alsine rubella; Silene acaulis; Draba arctica; Festuca brevifolia; Carex nardina.* Besides these, a few specimens of Lichens belonging to the genera *Peltigera, Parmelia, Capitularia*, too imperfect to be described. Lichens are far from taking a prominent place in the general vegetation.

Nearly similar were the conditions of vegetation I observed in mounting a part of the same ridge further to the east, to a point which is

formed by a prominent mass of trap, and seen from the sea is like a cone, and is called Innosuoset (a watch-tower). This point is from 3700 feet to 3800 feet above the sea. Of the plants gathered in this excursion the last, *Salix glauca*, was at the height of 3300 feet, and here at Innosuoset was found, in addition to the above-named plants, the *Draba alpina*.

Notes upon the Drugs observed at Aden, Arabia; by JAMES VAUGHAN, ESQ., Member of the Royal College of Surgeons of England, Assistant Surgeon to the Bengal Army, Civil and Port Surgeon at Aden, Arabia.

Such is the title of a valuable article communicated by Daniel Hanbury, Esq., to a late number of the 'Pharmaceutical Journal,' 1853. It is full of important information, collected by a gentleman every way qualified for such an undertaking, during an official residence at Aden. "With some of these vegetable productions," Mr. Vaughan observes, "the commercial and scientific world are already acquainted, with others they are less familiar, and of a few it may be presumed that they know scarcely anything. With regard to science and especially medicine, it is much to be regretted that some eminent Botanist does not turn his attention to this part of the world, where nature has been so lavish in her precious gifts, and where a wide field of research is open to him, from which he might make many important and original additions to the present stock of medical knowledge, and thereby establish a high claim to the esteem and gratitude of his profession in particular, and of the scientific part of the community generally. Scarcely anything is known at present of Eastern Africa beyond the sea-board, and the same remark applies to Southern Arabia. With regard to the latter country in particular, famous even in the early ages of the world for its valuable vegetable produce, it appears almost unaccountable that this country should be well-nigh as little known to us as it was to the learned in the days of the ancient Greeks and Romans."

We must refer to the memoir itself for the more full particulars of the Drugs described in the "Notes," and must content ourselves with mentioning those which especially demand further inquiry from the man of science, to determine the particular plants which yield them.

GUM ARABIC, *Gummi Acaciæ*, known in Arabia and on the African

coast by the name of *Sumgle.* The *Acacia* which yields this gum is generally a small shrub of a dry and withered appearance; occasionally however it shoots out into a tree of from twenty to thirty feet high. The Somalis on the north-east coast of Africa collect the gum during the months of December and January. Long incisions are made in the stem and branches, from which the juice flows, and when dry is removed. After the gum of a district has been gathered, it is sewn up in goat-skins, and brought on camels' backs to the great Barbara fair, or to some of the small settlements on the coast, and thence shipped for Aden and India. Three descriptions of the gum, styled severally *Felick*, *Zeila*, and *Barbara*, are exported from the Somali coast. 1, *Felick gum* is collected chiefly by the Margartain Somalis and those who inhabit the district of Gardaf and Cape Gardafui. None of this quality, which is esteemed the best, finds its way to Aden, but is mostly shipped to India. This is about 25 rupees the hundredweight in the Bombay market. 2, *Zeila gum*, so called from the port of that name. 3, *Barbara gum*, from the district of Barbara. *Zeila gum* sells at 15 and *Barbara gum* for 13 rupees the hundredweight in the Bombay bazaar. (Are these from one or from three species of *Acacia*?—Ed.)

Myrrh.—This Gum-resin, sometimes called *Murr* by the Arabs, but more commonly in this district by its Indian name *Heera Bôl*, is collected in great quantities by the Soumalis in the north-east part of Africa, and in the neighbourhood of Hurrur, further south. Small quantities of the best description of Myrrh have been lately collected in a district forty miles to the east of Aden, and brought hither for sale by the Soumalis, and this will doubtless soon increase. Four hundred and fifty hundredweight of Myrrh passed through the Aden Custom-house last year, and the selling price is 9½ rupees the 28 lbs. (Mr. Hanbury adds the remark, that two kinds of Myrrh are sent by Mr. Vaughan, evidently the product of different plants: one labelled Somali or African Myrrh, the Turkey myrrh of commerce; the other that which is produced forty miles from Aden; but nothing is said of the plants yielding either.)

Bissa Bôl (Arabic, *Hebbhakhada* of the Somalis).—This is another gum-resin collected by the Somalis on the opposite coast. It resembles the Myrrh already described. My impression is that the tree affording it is unknown to Europeans. It fetches at Aden 2½ rupees per maund (of 28 lbs.), and is sent to India and China and given to

milch-cows and buffaloes to increase their milk, and it is mixed with lime as a size to impart a bright gloss to walls which are covered with it. (This, Mr. Hanbury observes, is a gum-resin usually regarded as a species of Myrrh of inferior quality, formerly known as *East Indian Myrrh.* In the London market it has been lately offered under the name of *Gum Bhesaboll.* It is quite distinct from Indian aud African Bdellium.)

Hotai is the name of a gum produced by a small thorny tree which grows in the Somali country about Bunder Murayeh; it resembles the tree which produces the Myrrh, and attains the height of about six feet. The use of the gum is confined to the Somalis as a detersive for the hair.

Olibanum, styled *Lubân* by the Arabs and by the Somalis on the opposite coast, where the tree grows in great abundance. Five kinds are exposed for sale. 1. *Lubân Mattee,* from the place whence it is exported. 2. *Lubân Hunkur,* or *Aungure* (from Bunder Aungure). Large quantities of this frankincense are brought to Aden; pure it fetches three-quarters of a dollar per maund. 3. *Lubân Makur,* from the sea-ports of Ras Kurree, etc.; mostly shipped to Bombay. 4. *Lubân Berbera,* or *Mustika,* so called from the place of export. 5. *Arabian Lubân,* commonly called Morbat, or Shaharree Lubân.

Aloes and Senna (*Cassia elongata,* Lemaire-Lisancourt) and Indigo, we presume, may be traced to the respective plants that yield them.

Kât, the name of a drug brought into Aden from the interior, and largely used as a pleasurable excitant. It is imported in small camel-loads, consisting of parcels of twigs with leaves tied up in bundles, and it is the leaves that are chewed. 280 camel-loads are used in Aden alone. They are said to be the leaves of *Catha edulis* of Förskal. A figure is given of these bundles, and a full history of the plant.

Wabei, a poison extracted from a tree in the Somali country, obtained by boiling the root in water. The barb of the arrow is dipped into the inspissated juice, and renders a wound inflicted by it incurable. Mr. Hanbury supposes this plant may be *Carissa Schimperi* of Richard, identified with *Strychnos Abyssinica* of Hochstetter.

Copal,—brought from the African coast opposite Zanzibar, said to be dug up from the earth.

Sanguis Draconis, or Dragon's Blood, from Socotra, where the tree (*Dracæna Draco ?*) is said to grow in luxuriant abundance.

DUGGA, or DAGA-BOOT; a medicinal root growing on the Somali coast, used for almost every ailment in that part of Africa.

KORARIMA CARDAMOM (Pereira), *Kheil* or *Khil* of the Arabs.—A rare Cardamom, of which Mr. Hanbury has received fine specimens. The fruit is met with in the market of Mussowah.

WURRUS, or WARUS; a red powder of a plant resembling the Sesame, chiefly used as a dye. Two kinds are brought to market, the best from the interior, the other from the Somali coast. It is sent to Bombay, and is much prized for the light brown colour it imparts to silks.

NOTICES OF BOOKS.

SEEMANN, BERTHOLD, F.L.S., and Member of the Imp. Acad. Nat. Curios., Naturalist of the Expedition, etc.: *Narrative of the Voyage of H.M.S. Herald, during the years* 1845–51, *under the command of* Captain Kellett, R.N., C.B.; *being a Circumnavigation of the Globe, and three Cruizes to the Arctic Regions in Search of Sir John Franklin.* 2 vols. 8vo. London: Reeve and Co.

From the days of the illustrious Cook to the present time, it has frequently fallen to the lot of the naturalists to become the chroniclers of the scientific voyages which they were appointed to accompany. With few exceptions their narratives reflect great credit both on the accomplished writers themselves and on the Government which chose them for the service. In the instance now before us we might have remained for many years in ignorance of one of the most important voyages that ever sailed from our shores, if it had not been for Mr. Seemann's zeal and ability, conjoined to the remarkable facility with which, though a landsman, and a foreigner by birth and education, he acquired the British seaman's knowledge and habits. The commander of the expedition, Captain Kellett, was deputed, soon after his return, to join in the search after Captain Franklin; he left but slender materials wherewith to aid Mr. Seemann in completing the narrative, and a still greater drawback existed in the circumstance that our author was not attached to the Expedition till a year and a half after it had sailed from England, so that he was indebted for many important hydrogra-

phical and other details to the fragmentary journals of his messmates. When to these considerations we add that Mr. Seemann has been actively engaged in superintending the publication of the natural history of his voyage, and is himself the author of two parts, which have already appeared, on Botany, it must be admitted that his activity and intelligence deserve our cordial praise.

In the Narrative of the Voyage Mr. Seemann's style is lively and agreeable; but, as was to be expected, the work derives its chief interest from the botanical details and excellent sketches of scenery and objects of natural history with which it abounds. The melancholy death of his predecessor, Mr. Edmonstone, is related with much feeling by one of that gentleman's shipmates, and there is a good *résumé* of all the Arctic Searching Expeditions that have left our shores, from the pen of Mr. Petermann. Though the candid and modest preface should disarm general criticism, we must express our disapproval of the quotation of four pages of trash on the society of St. Helena. Mr. Seemann had neither time nor opportunity for forming any judgement on this little community, to which the officers, and particularly the naturalists, of many expeditions have been largely indebted for frank hospitality and ready assistance. Such second-hand censures are not only calculated to do mischief, but they stand out in disagreeable contrast both to the high scientific value of the work and to the amiable disposition of the writer.

Folia Orchidacea, Part III., *by* Professor Lindley.

So rapid is the appearance of this important work, that at the present rate of publication it may almost be considered monthly, and yet exhibiting no undue haste in the preparation. The present number is wholly devoted to the continuation of the genus *Epidendrum*, from the 100th species to the 253rd, and will doubtless be carried on in the forthcoming part.

Errata (*in the translation of Professor Liebmann's Memoir on American Oaks*). P. 326, line 20, *for* equator, *read* tropic; p. 335, line 6, *for* insect, *read* cochineal-colony; p. 335, line 36, *for* southern, *read* South Sea; p. 336, line 12, *for* tenuifolia, *read* lancifolia.

FLORULA HONGKONGENSIS: *an Enumeration of the Plants collected in the Island of Hongkong, by* Major J. G. Champion, 95*th Reg.; the determinations revised and the new species described by* GEORGE BENTHAM, ESQ.

(*Continued from p.* 58.)

SOLANEÆ.

Of the four plants belonging to this Order hitherto found in Hongkong, three have a wide range in East India and other tropical countries, and have become apparently naturalized in the island in waste places or cultivated lands. The fourth, although originally described as of Chinese origin, evidently extends on the one side to Sillet and Northern India, and on the other to the Moluccas.

1. Solanum *nigrum*, Linn.

This species includes nearly the whole of the *Morellæ veræ* of Dunal, about fifty supposed species. I have repeatedly endeavoured, but in vain, to sort out into varieties, from the characters given in the Prodromus, the numerous specimens I possess from all parts of the world.

2. Solanum *decemdentatum*, Roxb.—*S. Calleryanum* and *S. Osbeckii*, Dun. in DC. Prodr. vol. xiii. p. 178.—Probably also *S. biflorum*, Lour., and some others enumerated by Dunal, besides perhaps *S. crassipetalum*, N. ab E. in Linn. Trans. vol. xviii. p. 42, overlooked in the Prodromus. Roxburgh expressly states that the plant he described was raised in the Calcutta Garden from Chinese seeds, and is correctly quoted by Nees. Dunal however does not appear on this occasion to have had access either to Roxburgh's 'Flora' or to Nees's carefully worked-up paper on Indian *Solaneæ* in the Linnean Transactions.

3. Solanum *ferox*, Linn.

A common East Indian plant, of which the synonymy appears to have been carefully elucidated by Nees in the above-mentioned paper, but has since been thrown back into utter confusion in the Prodromus. The species includes at least the *S. ferox*, *S. lasiocarpum*, and *S. stramonifolium* of the latter work, but not the *S. stramonifolium* of Jacquin, which Nees has shown to be a West Indian plant allied to *S. torvum*, whilst *S. stramonifolium* of Lamarck is the East Indian form of *S. torvum* itself. The *S. ferox minus*, figured by Wight, Ic. t. 1400, with smooth fruit and narrow lobes to the calyx, can scarcely be the same as the form so designated by Nees, and is evidently a distinct species, as sug-

gested by Wight, unless it be a very prickly variety of *S. torvum*. To the synonyms of *S. ferox* may be added *S. hirsutum*, Roxb. Fl. Ind. vol. i. p. 571 (quoted by Nees, but overlooked by Dunal except as "*S. hirsutum*, R. in herb. Puerari"), and *S. immane*, Hance in Walp. Ann. vol. iii. p. 165, whose diagnosis agrees perfectly well with the common Indian species.

4. Physalis *angulata*, Linn.

SCROPHULARINEÆ.

1. Mazus *rugosus*, Lour.—Benth. in DC. Prodr. vol. v. p. 375.—*M. vandellioides*, Hance in Walp. Ann. Bot. vol. iii. p. 193?
   Hongkong.
2. Pterostigma *grandiflorum*, Benth. l. c. p. 380.
   Common in the Hongkong hills.
3. Pterostigma *capitatum*, Benth. l. c. p. 380.
   Ditches, Hongkong. Flowers $3\frac{1}{2}$ lines long, bluish-purple with a purple palate, in clammy heads, emitting a camphorated smell.
4. Limnophila *hirsuta*, Benth. l. c. p. 388.
   The specimens preserved were gathered on the opposite Chinese coast, but Major Champion believes that it is also found within the island.
5. Herpestis *Monnieria*, H. B. et K.—Benth. l. c. p. 400.—*Anisocalyx limnanthiflorus*, Hance in Walp. Ann. Bot. vol. iii. p. 195?
   Common in marshes.
6. Torenia *rubens*, Benth. l. c. p. 410.—*T. concolor*, Lindl. Bot. Reg. 1846, t. 62.
   Common on Mount Victoria and in other parts of the island. The plant is either quite smooth or slightly pubescent, and agrees in every respect with the Assam one, upon which the species was originally established. The reddish hue, which the upper parts of the plant and the calyces assume occasionally, and which suggested the specific name, appears to be accidental.
7. Vandellia *oblonga*, Benth. l. c. p. 413.
8. Vandellia *crustacea*, Benth. l. c. p. 413.
9. Bonnaya *verbenæfolia*, Benth. l. c. p. 421.
   Three common weeds for which no precise locality was recorded; the first has hitherto been only found in China, the two others are widely diffused over East India.

10. Buddleia *Lindleyana*, Forst.—Benth. l. c. p. 446.

From Colonel Eyre's collection, but doubtful whether gathered in Hongkong or on the opposite Chinese coast. Major Champion also gathered the *B. Asiatica*, Lour., on the mainland, in situations which induce him to conjecture that it may be likewise found in the island.

11. Buchnera *stricta*, Benth. in DC. Prodr. vol. x. p. 495.

West Point and Little Hongkong. I doubt whether this may not prove to be a mere variety of *B. cruciata*, Hum.

12. Striga *hirsuta*, Benth. l. c. p. 502.

Common with grass, upon which it is probably a parasite.

13. Centranthera *hispida*, R. Br.—Benth. l. c. p. 525; var. floribus pallide flavis.

Mount Victoria and Mount Parker. Major Champion, struck by the colour of the flower, so different from that of the common *C. hispida* (purple or pink), considered this as a distinct species; but, on a careful comparison, I can find no other distinctive characters, and the colour of the flower is found to be variable in several genera of this group, of which the greater number of species are probably more or less parasitical.

OROBANCHEÆ.

Æginetia *Indica*, Roxb.—Benth. in DC. Prodr. vol. xi. p. 43.

Abundant in ravines, usually parasitical on a species of *Andropogon.*

ACANTHACEÆ.

1. Thunbergia *grandiflora*, Roxb., var. *cuspidata*, N. ab E. in DC. Prodr. vol. xi. p. 55.

In a ravine at Sirwan.

2. Phlebophyllum *apricum*.—*Gutzlaffia aprica*, Hance in Kew. Journ. Bot. vol. i. p. 143.

Hongkong, towards Tytam Bay and Little Hongkong.—This plant so closely resembles the two Peninsular species of *Phlebophyllum* in habit and in character, that I cannot think that the sole observable difference—the greater length of the slender part of the tube of the corolla —is sufficient to warrant the adoption of it as a separate genus. The two upper divisions of the calyx are more or less joined together at the base, which is almost the sole character, and perhaps an insufficient one, by which *Phlebophyllum* itself is distinguished from *Endopogon*. As observed by Major Champion, there are in our plant what appear to be

minute rudiments of the upper stamens, but these exist also, at least in my specimens of *P. Kunthianum.* Specifically *P. apricum* differs from *P. Kunthianum* by the narrower bracts and calycine lobes, and by the greater length of the slender tube of the corolla; the spikes or heads of flowers are also much shorter than those of *P. Kunthianum*, but in the latter species they are often very much shorter than in the specimen figured by Wight (Ic. t. 448).

3. Codonacanthus *pauciflorus*, N. ab E. in DC. Prodr. vol. xi. p. 103.

Ravines of Victoria Peak. The specimens agree perfectly with those from Assam and Sillet.

4. Ruellia *tetrasperma*, Champ. sp. n.; foliis ovatis obtusis crenatis hirtellis, spicis paucifloris plerisque in capitula terminalia subhirsuta confertis, bracteis spathulatis, bracteolis linearibus, calycis laciniis obtusis basi connatis, ovario 4-ovulato.—Specimina adsunt semipedalia. *Caules* basi diffusi, radicantes. *Folia* breviter petiolata, rugosa, maxima sesquipollicaria, pleraque vix pollicaria vel etiam multo minora. *Capitula* intra folia suprema sessilia, nunc ad apices ramorum brevium axillarium quasi axillaria, nunc e spicis pluribus composita, ad apicem caulis ramorumque densa subglobosa. *Bracteæ* et *bracteolæ* ciliato-hirtæ, calyce subbreviores, hæ laciniis calycinis subconformes, illæ sæpius multo latiores. *Calyx* 2 lin. v. paulo longior, fere ad quartam partem longitudinis integer, laciniis 5 herbaceis subdilatatis. *Corolla* violacea, 10 lin. longa, infundibuliformis, tubo calycem superante in faucem latiusculam abeunte; laciniæ subæquales, latæ, obtusæ vel retusæ, margine ciliatæ; faux intus lineis 2 longitudinalibus barbata. *Stamina* didynama, inclusa. *Antheræ* ovatæ, glabræ, loculis parallelis muticis. *Ovarium* sessile, complete biloculare, loculis biovulatis. *Stylus* filiformis hinc pilosus, sub apice unidentatus, supra dentem subulatus, recurvus, hinc stigmatosus.

Victoria Peak. Technically speaking, this plant might be rather better referred to *Dyschoriste* or *Calophanes*, for the lobes of the calyx are less deeply divided than in the true *Ruelliæ*, and there are four only, not six to sixteen ovules; but the anthers are not calcarate nor mucronate as in those two genera, and the inflorescence and general aspect is very unlike either of them; whilst the habit, inflorescence, and corolla are precisely those most common in *Ruellia*. It is much to be regretted that several of the allied genera, having the style and capsule and general form of the corolla of *Ruellia*, could not have been united

with it, reducing to a mere sectional distinction the differences in bracts, in the degree of separation of the divisions of the calyx, and in the often inappreciable variations of form of the corolla, which make it necessary to modify the circumscription and characters of the genera with almost every really new species discovered.

5. Dipteracanthus? *calycinus*, Champ. sp. n.; humilis, erectus, glaber, foliis oblongis ovatisve dentatis in petiolum angustatis, floribus ad apices ramulorum geminis ebracteolatis, calycis lacinia suprema latiore.—*Herba* semipedalis, erecta, subfastigiato-ramosa. *Folia* maxima 3-pollicaria, obtuse acuminata, basi in petiolum longe angustata, pleraque minora ovata v. summa obovato-spathulata. *Flores* magni, ad apices ramorum sessiles (axillares, oppositi, gemma intermedia non vel vix evoluta). *Calyx* fere ad basin 5-partitus, laciniæ quatuor lineares, herbaceæ, 9–10 lin. longæ, acutiusculæ; quinta summa paulo longior obtusior et fere 2 lin. lata. *Corolla* bipollicaris, tubi parte tenui calyce breviore, fauce elongata obliqua, intus glabra nuda; limbi laciniæ latæ subæquales. *Stamina* inclusa, didynama, filamentis basi connatis, membrana brevi inter stamina superiora bidentata. *Antheræ* anguste oblongæ, loculis parallelis æqualibus muticis. *Stylus* glaber, filiformis, apice integer setaceus. *Capsula* basi compressa, asperma, a medio 4-sperma, omnino *Dipteracanthi*. *Semina* orbiculata, lævia.

Mount Parker. Flowers very large in proportion to the plant and pale violet. This again will not fit exactly into any of Nees's genera. I have placed it in *Dipteracanthus* on account of the general habit, the form and size of the corolla, and the structure of the capsule; but the enlarged upper division of the calyx is not usual in that genus, and the apex of the style, though variable, is described as always bilamellate. I observe however that in many species the longest division is scarcely dilated, and the other one occasionally reduced to a small tooth, almost as in *Ruellia*, and this character is perhaps after all of little value among the Ruellioid genera.

6. Lepidagathis *hyalina*, var. *dependens*, N. ab E. in DC. Prod. vol. xi. p. 253.

Abundant near the Buddhist Temple, East Point. This is a very low procumbent and pubescent form, resembling in habit the *L. Javanica*, but the flowers, the ciliate anthers, etc., are those of *L. hyalina*.

7. Dilivaria *ilicifolia*, Juss.—N. ab E. l. c. p. 268.

Little Hongkong, near the sea-shore.

8. Rostellaria *procumbens*, N. ab E. l. c. p. 371.
Hongkong.

9. Adhatoda (Tyloglossa) *Chinensis*, sp. n.; herbacea, diffusa, pubescens v. glabrata, foliis oblongis ovatisve obtusis in petiolum angustatis, floribus axillaribus utrinque subternis, bracteis orbiculato-spathulatis, bracteolis minutis.—*Herba* $\frac{1}{2}$–$1\frac{1}{2}$ pedalis, divaricato-ramosa, pube rigidula plus minus conspersa, rarius glabrata. *Caules* obsolete tetragoni, ad nodos inferiores radicantes. *Folia* majora 1–2 poll. longa, 4–5 lin. lata, obtusa, margine integerrima v. repanda, basi longiuscule angustata in petiolum tenuem 2–4-linearem, supra pilis rigidulis plus minus conspersa, subtus præsertim ad venas hirtella, lineolis (raphidibus) parum conspicuis; superiora gradatim minora et in formam ovatam v. obovatam abeuntia. *Flores* in axillis utrinque 1–5, sæpius 3, illis *A. Tranquebariensis* paulo majores, bracteis parvis petiolatis foliaceis orbiculato-spathulatis fulti. *Bracteolæ* squamiformes, acutæ, pedicellos brevissimos vix superantes. *Calyces* $1\frac{1}{2}$–2 lin. longi, laciniis 5 a basi solutis parum inæqualibus lanceolato-subulatis puberulis, apice subulato plus minus recurvo. *Corolla* quam in *A. Tranquebariensi* angustior, cæterum similis. *Antherarum* loculus inferior in appendicem cuneatam acutam desinens. *Capsula* quam in *A. Tranquebariensi* angustior. *Semina* granulato-tuberculata nec echinata.

Common in ravines of Mount Victoria. Though evidently allied to *A. Tranquebariensis* and *Orixensis*, this species differs essentially in inflorescence, in the smallness of the bracteolæ, and in the more slender flowers and fruits; it has also none of the hard woody appearance of the other two. It may prove to be the *A. aspera* of Nees, but that species has been unfortunately established on mere fragments, insufficient to identify it with certainty, at any rate without more perfect specimens procured from the same locality, the Philippine Islands.

10. Rungiæ sp.? Unknown to me, but the specimen is insufficient for identification.
Gathered in autumn on Mount Parker.

11. Hypoestes *purpurea*, R. Br.—N. ab E. in DC. Prod. vol. xi. p. 509; var. *glabrior*.
Abundant near the Buddhist Temple at East Point; also Little Hongkong.

I had also from Mr. Hinds a specimen of the *Barleria cristata*, Linn., which is not among Major Champion's plants.

VERBENACEÆ.

1. Verbena *officinalis*, Linn.
On roadsides.

2. Caryopteris *mastacanthus*, J. C. Schauer in DC. Prod. vol. xi. p. 625.
In ravines of the Black Mountain.

3. Premna *integrifolia*, Linn.—*P. serratifolia*, Linn.—J. C. Schau. l. c. p. 632.
Near the sea, Hongkong.

4. Callicarpa *Reevesii*, Wall.—J. C. Schau. l. c. p. 641.
Hongkong. A shrub.

5. Callicarpa *integerrima*, Champ. sp. n.; ramulis cum cymis foliorumque pagina inferiore tomento stellato flavicante dense lanatis, foliis petiolatis late ovatis acuminatis integerrimis supra pube stellata conspersis, cymis folia subæquantibus, floribus parvis numerosissimis, calyce lanato minute 4-dentato.—*Folia* 3–4 poll. longa, 2–2½ poll. lata (inferiora mihi desunt), supra viridia v. subflavescentia, mollia, punctis glandulosis inconspicuis sub lana reconditis, petiolo semipollicari. *Cymæ* amplæ, laxæ, pedunculo 1–1½-pollicari, ramis primariis elongatis. *Flores* magnitudine *C. macrophyllæ*.
Hongkong. The broad entire leaves and the dense golden-coloured tomentum readily distinguish this species from the *C. macrophylla*, *C. lanata*, and others to which it is allied.

6. Callicarpa *tomentosa*, Willd.—Hance in Walp. Ann. vol. iii. p. 236.
Common in ravines. Subarboreous.

7. Callicarpa *tenuiflora*, Champ. sp. n.; ramulis cymis foliorumque pagina infera pube vix floccosa canescentibus, foliis breviter petiolatis obovatis acuminatis serrato-crenatis infra medium contractis basi subcordatis, cymis multifloris parvis laxis divaricato-dichotomis folio pluries brevioribus, calyce minuto truncato, corolla infundibuliformi. —Affinis *C. rubellæ*; pubes laxior, folia multe latiora (5 poll. longa, 2–2½ poll. lata), submembranacea, acute acuminata, supra viridia et pilis simplicibus v. rarius substellatis conspersa. Inflorescentia et flores fere *C. rubellæ*, sed calyces villoso-tomentosi, et corolla canopuberula, 1½ lin. longa, laciniis tubo duplo brevioribus.
At Saywan.

8. Callicarpa *longifolia*, Lam.—J. C. Schauer in DC. Prod. vol. xi. p. 645.

At Saywan. There is also a specimen of what may be a mere variety, with narrow almost sessile leaves, small, close, nearly sessile cymes, and rather larger flowers.

9. Clerodendron *inerme*, R. Br.—J. C. Schau. l. c. p. 660.

Very common near the level of the sea.

10. Clerodendron *canescens*, Wall.—J. C. Schau. l. c. p. 665.—*C. hæmatocalyx*, Hance in Walp. Ann. vol. iii. p. 238?

Also common near the level of the sea.

11. Clerodendron *pentagonum*, Hance in Walp. Ann. Bot. vol. iii. p. 238?

Hongkong. The specimen is in fruit only, but agrees well with Hance's character, except that the leaves, although often quite entire, have many of them a few coarse teeth towards their extremity.

12. Vitex *trifolia*, Linn.; var. *unifoliolata*, J. C. Schau. in DC. Prod. vol. xi. p. 683.—*V. ovata*, Thunb.

Hongkong.

LABIATÆ.

1. Pogostemon *parviflorum*, Benth.—DC. Prod. vol. xii. p. 152.

Mount Parker. An imperfect specimen, but it appears to belong to this common North-east Indian species.

2. Dysophylla *auricularia*, Blum.—Benth. in DC. l. c. p. 156.

In ditches and moist places.

3. Salvia *Fortunei*, Benth. in DC. Prod. vol. xii. p. 354.

In ravines.

4. Scutellaria *Indica*, Linn.—Benth. l. c. p. 417.

In ravines.

5. Anisomeles *ovata*, Br.—Benth. l. c. p. 455.

Happy Valley.

6. Leonurus *Sibiricus*, Linn.—Benth. l. c. p. 501.

On roadsides.

7. Leucas *mollissima*, Wall.; var. *Chinensis*, Benth. l. c. p. 525.

On roadsides, Little Hongkong.

8. Teucrium *fulvum*, Hance in Walp. Ann. Bot. vol. iii. p. 270.

Hongkong. This, as well as my *T. Fortunei* (in DC. Prod. vol. xii. p. 583), is very probably a mere variety of the common North-east Indian *T. quadrifarium*.

Mr. Hance describes also a new Mint cultivated by the Chinese of Hongkong in their gardens. He gives it the name of *M. reticulata*, but from his description it is most probably some garden variety of the *M. viridis*.

(*To be continued.*)

A Brief Notice concerning the Agricultural and Horticultural Society of India; by* Dr. N. WALLICH, V.P. Royal and Linn. Soc.

The Agricultural and Horticultural Society of India is, next to the celebrated Asiatic Society of Bengal, the most known, and certainly the most popular among the scientific and practical institutions in British India. In numbers of members it exceeds them all. It was established at Calcutta on the 14th September, 1820, by the late Rev. Dr. William Carey, one of the most extraordinary men who ever came to India, both as a Missionary, a profound oriental scholar and author, and a botanist and agriculturist. In the prospectus which that pious and good man had printed and circulated five months previously, and to which he afterwards added a list of desiderata, the urgent necessity of such an institution being formed in a country where immemorial customs and habits had for ages past stood in the way of amelioration and progress in the arts of civilized life, were briefly but forcibly set forth. The successful labours of the Society during its thirty-two years of existence, and of the many branch societies which have emanated from it in different parts of India, amply attest the wisdom and soundness of the founder's views. Year after year has this flourishing institution been improving and enlarging its sphere of activity, until it has at present attained a position of much importance and influence, and become a real blessing to the country. No wonder, therefore, that it enjoys the substantial support and patronage of the Government of India as well as the Court of Directors at home, evinced by annual pecuniary grants, and by frequent and large donations of agricultural and other seeds, and communications of papers possessing public interest, either

* We do not yet know so much in Europe as we ought to know of the Individuals and Societies which have furthered the cause of the departments of science alluded to in the heading of this article. We are furnished by our invaluable friend Dr. Wallich with a notice respecting one of the most extensively useful of these societies, and we trust this will be followed by some others.—ED.

scientific or practical; such as official reports and the like documents from Company's servants and others, having reference to the labours of the Society. It is in possession of some property of its own, and derives annually a considerable income from its members, who, as might be expected, are chiefly Europeans, but comprise also many respectable natives. Of the latter there were last year two Vice-Presidents, besides two other members of the Society's council. The entire number of members, dispersed all over India, was at the close of last year 649, which is exceedingly remarkable, considering the constant fluctuation of the white population in the country; besides ten honorary members. An extensive correspondence is maintained with various parts of the world, and as many of the members are practical men, agriculturists, planters, etc., and a praiseworthy zeal moreover prevails among all classes of Europeans, to cultivate those pursuits which form the main purpose of the Society, a great variety of useful papers have from time to time been presented, which, together with the monthly proceedings, have been published in eight volumes of Transactions, and subsequently (since 1840) in as many volumes of the Society's Journal. It may be truly affirmed, that these sixteen volumes contain, upon the whole, as great a mass of valuable practical information and useful reading as any other Society has ever produced within the same time. It would far exceed the limits of a brief notice were I to give any even a detailed account of the topics treated of, and by whom, in those volumes; among the subjects however I may mention cotton, sugar, indigo, tea, coffee, tobacco, rice, silk, wool, vegetable fibre, paper, cochineal, caoutchouc, lac-dye, Indian fruits, manures, timber-trees, topographical accounts of various districts, etc., many of which are treated very extensively and satisfactorily. Some of the addresses by the Presidents and others (W. Leycester, Esq., the first among the former, Sir E. Ryan, and Lord William Bentinck) are of deep interest and weight. Large and expensive importations are made yearly from abroad, of agricultural and horticultural implements and seeds, the latter being distributed gratuitously among members, as well as among the humbler classes of natives, cultivators, market-gardeners, etc. In short, the Society is determined to *do good to the country by broadcast*—at least it acts as if such were its motto.

In addition, the Society maintains an experimental garden on land lent to it for the express purpose a number of years ago, in the Com-

pany's Botanic Garden, but which it has been recently resolved to relinquish, in order to establish a garden on grounds to be purchased nearer Calcutta, and on the same side of the river, and therefore more readily accessible to the members. Periodical shows are held of agricultural and horticultural produce, which are always numerously and highly respectably attended, and on which occasions pecuniary and other prizes are awarded to successful cultivators, who in the majority of instances are Natives. Its affairs are administered by a President, four Vice-Presidents, a Treasurer, and a Secretary, all of whom, together with twelve ordinary members, constitute the Council; and by the following eleven standing committees; namely 1, for *Sugar;* 2, *Cotton;* 3, *Silk, Hemp* and *Flax;* 4, *Coffee* and *Tobacco;* 5, *Oil* and *Oil-seed;* 6, *Grain;* 7, *Implements of Husbandry and Machinery;* 8, *Nursery Garden;* 9, *Fruit and Kitchen Garden;* 10, *Floriculture;* and 11, *Translation.*

I have already adverted to the distinguished and steady patronage of the Indian Government as well as the Honourable Court of Directors at home, which very substantially contributes to the Society's flourishing state and success. In conclusion I may adduce, as a proof of the high estimation in which its labours are held by those who have it most in their power to watch over its operations and to promote its efforts, the fact, that from its very commencement, each successive Governor-General has honoured the Society by readily assenting to become its patron. The late Marquis and Marchioness of Hastings were its first patron and patroness. On their departure from India in 1823 they were succeeded by the Earl and the late Countess of Amherst; after whom came Lord William Bentinck, Earl Auckland. Some of their addresses on the occasions are very interesting; especially a letter from Lord W. Bentinck, on his departure from India in 1835.

On the BOTANY *of the* NORTH-WESTERN DISTRICT *of* WESTERN AUSTRALIA.

(*Continued from* p. 122.)

I first saw a small tree belonging to the Natural Order *Pittosporeæ*, probably *Bursaria spinosa*, on the Irwin, and afterwards on the banks of other rivers to the north. A beautiful honeysuckle-like *Marianthus*, with pale red flowers, which grow in larger clusters than the flowers of

M. erubescens, but without the sweet scent of that species, appears on the Chapman. I also found a curious creeper, with narrow linear opposite leaves, and flowers of four sepals, resembling a small *Clematis;* the flowers have eight anthers, which grow in a circle round the germen, which terminates in two styles, and contains two ovules; the sepals are permanent, and become wings for dispersing the seeds; this plant first appears in the crevices of the limestone rocks on the west side of the largest of the lakes, and it grows among bushes in calcareous soil, in many parts of the Champion Bay district.

The highlands near the Murchison afford a curious tree, which I think belongs to the Maple family (*Sterculia?* Ed.): it grows about twenty feet in height, having a trunk about one foot in diameter, and about ten or twelve feet high, with a smooth, thick, and very tough bark; the branches are numerous, spreading regularly into a compact hemispherical head; the leaves are palmate, about the size and not unlike in shape to those of the Sugar Maple; the flowers are borne in branching racemes at the ends of the branches, they are white, large, and showier than the flowers of Maple; the males and females are distinct, but grow mixed together on the same racemes. I have not yet seen the seed-vessels of this tree, which is deciduous, but in a very curious way: at the time I saw it, some of the trees were in full foliage and fast bursting into flower; others were leafless, the leaves newly fallen off and lying under the trees; others just bursting into leaf, with foliage of a beautiful light green colour; to all appearance it would seem a tree which would be altogether unable to resist the winds, which blow constantly in this district in the dry season with such force as to bend and almost annihilate the stubborn Gums, but from some unknown cause they are unable to bend a branch or injure a leaf of this beautiful tree, which often grows on the ridges of the hills, as it were in defiance of them.

Two new species of *Diplopeltis* grow in the Champion Bay district: one, with clammy curled leaves about three inches long by half an inch in breadth, bears little resemblance, except in its flowers and seed-vessels, to any of our Swan River kinds; the other species has oval, entire, smooth, green leaves, and similar seed-vessels; the flowers I have not yet seen.

The sand-plains to the north of Dundaragan produce a fine shrub belonging to *Byttneriaceæ* and to the *Pleiocarpeæ* division of the Order, near *Sringia;* it is a shrub about six or eight feet high, repeatedly branched,

each branch terminating in a dense corymb of snow-white flowers, from nine inches to a foot in diameter; the leaves are from two to three inches long, and about an inch wide, jagged and sinuate at the edges, green and hairy above and white below. The most perfect form of this plant is to have a five-parted white petal-like calyx, five small cup-shaped petals, five coloured purple anthers, opening at both sides to discharge the pollen, and five barren petal-like anthers, alternate with the fertile ones; the styles are five in number, free next the germens, but partly or rather slightly adhering above; the carpels are free, five in number when perfect, but rarely more than three are produced; they each contain a single seed, which is large when compared with the other Australian genera of this order; the carpels are curiously crested. Besides this, which I consider the most perfect form of the plant, there are many female plants which are without anthers of any kind, and many that have only petals like anthers. All the forms bear seeds only sparingly; those forms where the anthers are wanting sometimes bear more seed than the perfect ones, but among the whole there is not one seed produced for every thousand flowers; the plants creep by their roots and grow in great numbers together, sometimes spreading over acres*.

The genus *Hibiscus*, of the Natural Order *Malvaceæ*, produces several fine species in the country travelled over. The first new species I met with in the deep rocky gully which runs into "Cockleshell Plains;" this species grows two feet high, with trifid deeply indented leaves, the divisions linear, and indented at their edges; the flowers are rose-coloured, marked with deep crimson spots at the base of the petals; this beautiful species grows also in the Valley of the Lakes and at Champion Bay, where it was first found by Lieutenant Elliot, the officer in command of the troops first sent there; the plant is known by the name of Elliott's *Hibiscus*.

A yellow *Hibiscus*, with trifid filiform leaves and strong woody stems four or five inches in diameter, and growing twelve or fifteen feet high, is found in abundance on the sand-hills near the barracks at Champion Bay. Another new species, with pale blue flowers and very hispid leaves and flower-stalks, grows on Moresby's Range, near the White

* The anthers are turned, and although the carpels appear to be free there is a connection between them in the centre. As a genus, the plant is not distinct from *Rulingia*.

Peak. A small but very elegant species of this genus, with gooseberry-shaped hoary leaves, and stems from one to two feet high, bearing abundance of lilac flowers, grows on the left side of the brook-course called the "Four-mile Gully," near the crossing-place, four miles to the south of the Murchison, and also on the right bank of the Murchison, about two miles below the mines.

Of the curious Natural Order *Droseraceæ*, or Sundews, I found several fine plants. The most beautiful of the genus *Drosera*, which I have yet met with, resembles *Oxalis versicolor* in the colour of its flowers, they being white with a crimson eye, and they are beautifully variegated with crimson veins; these plants grow a foot or eighteen inches high, growing in clusters of several together; the sepals are large and glabrons, and in this and the two following species they close over the flowers at night and during wet weather; the plant grows abundantly in a White Gum forest about four miles to the north of Dundaragan. Another new *Drosera*, with bright scarlet flowers and glabrous sepals larger than the petals, is found near the Yandyait Spring, to the east of the Hill river; this plant grows about a foot high. Neither this nor the preceding species have any tendency to creep or to support themselves; but another nearly allied species, which agrees with them in the large glabrous sepals, is of very slender habit, climbing on everything it comes near: the flowers are white, or but slightly marked with red in one variety; in another, which appears to differ from it by only growing a little stronger, they are always of a pale red colour. The white variety of this species grows near the first spring on the Hill, and on a sand-plain to the east of the spring; the red variety grows on a sand-plain, near where the road first crosses the Hill river. A large rose-coloured species of this genus, which differs from *D. macranthum* in having glabrous flower-stalks and but slightly villous sepals, grows on the first sand-hill the road passes over to the north of Dundaragan. I found another very remarkable species, agreeing with *D. macranthum* in size, climbing habit, and the form of its leaves, but having smaller and deeper rose-coloured flowers, and instead of glands, the flower-stalks and sepals are covered with long grey hairs; this plant grows in a swamp near the Yandyait springs, where the roots were under water when I found it; it also appears near the base of Mount Lesueur. This species and the following differ remarkably from other *Droseras* in their roots, which are naked white bulbs growing two to-

gether, as in some Orchideous plants; that is, a new bulb forms by the side of the flowering one, destined to flower the following season. The other double-rooted species alluded to appears on the banks of all the rivers and brooks from the Hill, often growing on their banks with its roots under water when the plant is in flower, but only in situations where the roots are dry in the dry season; this species grows about two feet high, usually in large tufts interlaced and supporting themselves in that way, but seldom clinging to other plants for support; the flowers are small and of a pale lilac colour.

I gathered a few plants of a beautiful new *Drosera*, with large scarlet flowers; this plant was of a stiff upright habit, growing about a foot high, on the side of the lake Dalaru, in a spot where the ground had been covered with water in the winter. I found a curious little Cruciferous plant, apparently belonging to a new genus, among a cluster of Boordi (a species of kangaroo rat) holes, on the limestone part of Conolly's station; the plant is an annual, with pinnatifid leaves, formed like *Banksia dryandroides;* the stems grow flat on the ground, and the flowers are sessile in the axils of the leaves, but after flowering, the peduncles lengthen out, growing straight down, and burying the small round seed-vessels about an inch under the surface of the ground; I could not observe any partition in the pods when ripe, they were filled with seeds mixed with a gelatinous substance, similar to what appears on the seed of Cress, when soaked in water.

On a sand-plain between Martin's spring and the Hutt river, and also on the great sand-plain between the Hutt river and the Murchison, is found an aphyllous Dilleniaceous plant, apparently belonging to a new genus; when not in flower, the plant looks like *Daviesia juncea;* the flowers are yellow, about an inch in diameter; the anthers, seven in number, are united in a tube round the germen; the filaments free; the seeds have an arillus, as in other genera of this Order. When in flower, this is a very ornamental plant.

On Messrs Davis and Walcott's station on the Greenough, are two new species of *Loranthus*, both parasitical on the Raspberry-jam tree. One of them resembles *Loranthus Preissii* in foliage, but the tubes of the flowers are longer and narrower, and of a different colour, the lower part of the tube red, the upper half yellow; they are also of a different shape, having a sort of ringent mouth. The other species has foliage like *Loranthus miraculosus*, but they have a hoary appearance, being

closely covered with minute hairs; the corolla is small and green, with crimson filaments.

I met with two or three species of a genus with clammy leaves, opposite or in whorls, bearing blue flowers, and having seed-vessels shaped like *Antirrhinum*, and with very small seed; also a little creeping plant like *Clintonia pulchella*, which grows abundantly by the sides of the pools near the mines on the Murchison; I suppose it belongs to *Scrophularieæ*, but my specimens of them are not yet come to hand, and I cannot describe them correctly. I met with several new *Solana* on the Murchison. One is a shrub about two feet high, with slender numerous aculeated branches, and small oval leaves about an inch long; it bears small blue flowers and berries about the size of swan-shot; they are white when ripe, sometimes with alternate stripes of green. Another stemless species of *Solanum*, with large white downy thorny leaves, is common on the Murchison, but the flowers were past, only their calyx remaining, and I could find no seed-vessels. But the most interesting plant I met with belonging to this Order, has small black flowers, velvety inside: the leaves are about an inch and a half long and about half an inch wide; the stems and leaves are without spines: the plant is very rare on the great sand-plain between the Hutt and the Murchison.

A fine plant belonging to *Asperifoliæ*, and apparently forming a new genus*, appears in great abundance and perfection on the sand-banks in the sheltered bed of the Irwin river; it grows to be six or eight feet high, with numerous branches, which terminate in panicles of large, light blue, Borage-like flowers; the anthers and style, stigma, etc., of this plant are at the time of flowering covered by a curious calyptra, formed by five scales, which rise from the back of the anthers in the lower part of the tube next the corolla; these scales are firmly united by interlaced cilia, but in the upper half they are free, and grow in a spiral manner coming to a sharp point; the style comes in contact with the pollen of the anthers in passing up through this covering, but it ultimately rises above the calyptra, forcing open, as it passes, the spiral part, which, as soon as it is passed, closes on the style and capitate stigma. The plant is perennial, with a sort of woody stem, five or six inches in diameter near the ground; it rises readily from seed, and would be a great ornament to the gardens and shrubberies of Perth. A splendid *Lesche-*

* No doubt *Trichodesma*, Br.—Ed.

naultia, with bright scarlet flowers, larger and finer than any species described, was first brought to me by Mr. Lock Burges, from the grassy hills to the east of the Hill river. I afterwards saw the same plant, growing sparingly on the sand-plain to the north of the Diamond Spring.

(*To be continued.*)

The VEGETATION OF NORTH GREENLAND; *translated* (*by* Miss Gurney) *from 'The Danish Districts in North Greenland, their Geography, Produce,' etc.*, *by* H. Rink. Copenhagen, 1852.

Plants used for Fuel and Food by the Greenlanders.

We have in another place already spoken of the impossibility of keeping cattle in North Greenland; still less could it be supposed that any plants could be cultivated to such an extent as to serve for food for the people. The Danish officials have at most of their posts made a little garden before the house, and tried how far many of our garden plants could be raised by taking all possible pains to use the short summer. At Jakobshavn and Godhavn (both 69° 2′) they have succeeded in getting up Turnips and Radishes; Green Kale, Spinach, Lettuce, and Chervil grow freely in the open air, but the Kale and the Chervil almost entirely lose their proper taste and pungency. Carrots can hardly be brought to a size to be known as such, and Potatoes do not grow as large as those which are found produced from old ones brought home on board ship without any earth. At Omenak (71°) also we may have Lettuce, Scotch Kale, and Radishes in the middle of August, but scarcely Turnips of any tolerable size. These are vegetables of which the roots and leaves only are used; of course those producing fruit or seed are out of the question. Even this degree of horticulture requires the greatest care: the manure must be scraped up in the neighbourhood of Greenland houses, where fertilizing substances must have lain during the many years required to bring them to the necessary point of decay in this cold climate, and part of the seeds have to be sown early, and the warmth of a stove used to bring them forward for planting out as soon as the ground is thawed to the depth of two inches. Gardening can only be carried on as an amusement, in pleasing remembrance of the enjoyments of home.

The only plants which can enter into the question of economy are certain wild ones, which serve for *fuel*, or for *food* and *medicine*.

Fuel.—For this purpose Willows and dwarf Birches are used principally, but also some low bushy plants, *Empetrum*, *Vaccinium*, *Ledum Grœnlandicum*, *Andromeda tetragona*, which last appear to be very resinous, as they quickly flame up when lighted. The Birches and Willows, which are larger and more important, are never wanting, though they seldom abound in equal proportions, sometimes the one, sometimes the other prevailing in different places. They are generally found to have their roots fixed in clefts, and creep along the ground to a length of three or four ells; just at the root the stems may be two or three inches in diameter, but for the most part not more than an inch, and very much knotted and twisted. There are a few spots where a number of these bushes, being collected, do so support each other that they rise to the height of an ell and a half at most, and form something like a thicket. Such a willow-copse may be found here and there about Godhavn, and particularly on the north-west and north-east sides of the Disko Fiord, at Koevsak and Qvannersoit; here it only covers strips of some hundred ells in length, where the ground is gravelly, but the greater part of this low tract is swampy, and covered with tufts of Sedges and Lichens. On the east side of Disko Bay the Birch-trees appear to prevail, but there are but few places where any considerable collection of them is to be found. The Greenlanders gather the wood on the hills, over which they are scattered, especially in the winter, when the twigs are brittle; even at Jakobshavn, where they have for many years supplied the tile-stoves, they can in a couple of hours get a sledge-load on the nearest hills. From the south-eastern part of the bay runs to the east a hollow which bears the name of Orpiksoit (the great wood), and in the district of Upernivik they talk much of such a wood (Orpik), which is said to exist at the head of the Laxefiord, and in which a rein-deer is said once to have hidden itself from its pursuers; but it is much to be doubted if any of these trees are much more than an ell in height, or that anything could be seen of the woods we may have beneath us, when we drive over the snow across these tracts in winter.

On the outer and lower islands the bushes, such as Bear-berries, are more scarce than on the eastern coasts within the Fiord, and altogether

this kind of fuel can only be regarded as of any essential use during the wandering life the inhabitants lead in the summer, and as a little help in the milder months of the winter. Of greater importance is the bed of vegetable remains which so generally covers the rocky ground, or the shingly hollows between the hills, and which in Greenland is called turf, though very different to the turf with us, and much more closely allied to the actual vegetation which grows on it. The cold climate, which allows only of so slow a decay and process of change into mould, is the cause of the unchanged state of the relics of former generations of plants being accumulated under the present. Even on the growing stems, particularly on those of the *Andromeda*, the dead leaves remain adhering for several years; and the bushy plants which form the thick tufts on the rocks and gravelly bottoms can hardly be said to grow in earth, but rather in a thick matting of dead plants, which certainly are partially decayed into mould, but are far from having undergone the decomposition which has taken place with the plants of our turf-mosses. This kind of turf formation is found less in swampy and wet spots than on the lower hill-sides, and where there is any flat place on these. The greater tracts of flat land which present hollows, with swamps or lakes, are in general more barren, only interspersed with Sedges and Lichens, which form tufts around wet marshy lakes. Such low hillocks are found in the more southerly parts, on the coast and islands of Disko Bay, up to Disko and the mouth of the Waigate; here the turf formation becomes rarer, whilst we perceive the commencement of a new material for fuel in the coal which is here found extending along the coast northward, though the turf does not entirely cease, and even in the most northerly district some use may be derived from it. There are two varieties, of no very marked difference: the one consists principally of moss, and is chiefly found on the low outer islands; it is very light and bulky, and therefore is less valuable for fuel, but it generally forms the deeper layer in the little turf island off Egedesminde; it rests on a rocky ground two and a half feet thick, and all beyond the depth of one foot is totally frozen. These beds of vegetation on low rocky islands can hardly be ascribed to anything but the manure derived from the birds that make them their resting-places; on these islets such grassy tufts are often seen on the tops of hillocks, marked off distinctly from the rest of the ground, and on the steep bird-cliffs we may observe the soft green grass and sorrel

which has taken root in the rifts below the nesting-places. Better is the other variety of turf, which is found to contain imbedded in its masses the twigs and roots of the low bushes, particularly of the *Empetrum*, and thus to consist of more woody remains. This is met with on the eastern coast of Disko Bay, in the district of Christianshaab and Jakobshavn. The best in quality that I have seen was from the colony of Christianshaab, where it is very compact, and approaches nearly to that of our Lyng Mosses. On the whole the Greenland turf is lighter, more porous, and less useful for burning in proportion to its bulk, than turf from the mosses or bogs of more temperate climates; but it is sufficiently good for culinary purposes and for heating common stoves, except in the four coldest winter months, when it may serve as an adjunct to coal or wood, but will hardly suffice alone to warm a house, unless the stove be contrived on purpose, and very spacious.

The lesser degree of heat derived from this turf is however compensated by its abundance and the ease of obtaining it. It is cut in tolerably large pieces of one-sixth or one-eighth of a cubic foot, and about four inches deep, with the outer green surface. At Claushavn and Jakobshavn this fuel has been in use for above fifty years, procured in part immediately around the houses, and in part from a distance of not more than 1000 ells, and at the rate of 20,000 to 30,000 pieces yearly, though of course in larger quantities of late years, since stoves have been in use in Greenland dwellings. The supply is far from being exhausted; and we must remember that the places were not chosen for building specially because of the ease of obtaining this fuel, but that it exists in this manner along the whole coast, so that we may consider the supply inexhaustible. At Claushavn a Greenlander hired for the purpose could cut 500 turfs in a day. These have then only to be turned, dried, and stacked, generally within the house. In most years the drying is no trouble: for the fitting-up of the Greenlandish or so-called Danish houses, inhabited by the married servants of the company, the Directors have long been in the habit of providing stoves of a suitable construction for cooking, at a very low price; it is calculated that such a stove, for the use of one family, requires 8000 to 10,000 pieces of turf, and that, with the addition of the Greenland stove-lamp, which can hardly be dispensed with, this amount of fuel will suffice without coal or wood.

As the sea in other respects furnishes the principal means of living to the inhabitants of this coast, so does it in measure supply the want of forests in Greenland, by bringing thither timber from unknown distant regions. The driftwood is brought up Davis Strait, as it seems, by the same stream which brings the drift-ice from Spitzbergen round Cape Farewell. Whence it originally comes is not yet with certainty known, but it appears to me reasonable to carry out the analogy with the drift-ice, and to suppose that it is borne into the sea by the Russian or Siberian rivers, goes by the north round Iceland, and so the same way as the ice. It is thrown up in the greatest plenty on the coast of South Greenland, and thence in decreasing quantity up to Upernivik, where it is still found, though rarely. The Eskimos at the extremity of Baffin's Bay hardly know what it is. The only other possible starting-point would be the North American rivers; but there is no appearance of any current setting over from them to the coast of Greenland, whereas the masses of ice from Baffin's Bay and the coast of North Greenland are carried over to the west, and down to the coast of Newfoundland. In agreement with this supposition, the drift-timber is found chiefly on the southernmost parts of the North Greenland coast, and the net-work of islands is there peculiarly adapted to catch it. Hence it proceeds to the south-east bay and Green Island, but is wanting from the east side of Disko Bay up to Waigate. A small quantity touches the south side of Disko, but in the part of the island bordering on the Waigate it is tolerably plentiful, and then it begins again on the continent at the northern opening of the Sound, and a good deal is washed up at Hare Island. It does not appear to enter Omenak's Fiord, and but little reaches Upernivik. Floating wood is collected for use scarcely anywhere but in the Egedesminde district, where it is found near the trading place Aito, and on the outer islands, and in pieces of all sizes, the largest as whole stems of fir-trees, of about twenty ells in length. Here the Greenlanders use it for building and for firing, and when they find it on their journeys they drag it above high watermark, which is a token of appropriation. We may suppose that all that the sea here casts up is used, and it can scarcely amount to twenty fathoms yearly along the whole district. It is less used in the Waigate, and has therefore accumulated; at the southern extremity of the district of Upernivik it is gathered to the amount perhaps of one fathom yearly.

Berries are the only vegetable food which the Greenlanders use in any quantity, and of these only one of the three existing species, namely the Krække-berry, *Empetrum nigrum*. Nature provides for the preservation of this fruit through the year, in this cold climate, in a remarkable manner. It is obvious that there is scanty summer-warmth to bring to perfection such fruits as contain nourishment as well as acid and saccharine elements, and that but a short space of time can intervene between their ripening and the winter's frost*. It was regarded as an unusual exception, that in the warm summer of 1850, ripe Krække-berries were found by the Waigate in the middle of July. They are pretty generally ripe in the beginning of August, and after the 20th of this month begin the night-frosts, which stop all further advance, but at the same time hinder decay; in the following month an overspreading covering of snow prevents their drying up, and keeps them unchanged, till the warmth of the following summer again melts the snow in the month of May. Some winters but little snow falls: then the Greenlanders can in some places furnish themselves with berries all the season; as, for instance, I observed at Jakobshavn in 1850–51, that the women and children used to go out to collect them and return with baskets full; they have indeed an implement for getting them up out of the snow. Most are gathered in the autumn, and in May; and of their immense numbers on the coasts which look eastward, we have already spoken in our account of the weather in 1850, but the warmth of summer has less influence on this sort of berry than on any other, and there is scarcely a year in which it is not abundant. The Krække bush may be considered the most widely-spread of all the plants of North Greenland, and as composing the larger portion of its vegetation. As to the quantity of fruit, there is a great difference whether it grows on an eastern or western aspect. They are regularly used in the autumn, as a kind of dessert after the customary meal of seals' flesh; they are set out, like this, in a dish, on the floor, mixed with small pieces of

* The fine summer (of 1850) produced its effect in the unusual quantity of berries in the district east of Disko Bay, in the months of August and September. The Krække-berries, which are the most common, were so full of fruit, that they were like bunches of grapes, and the ground which they covered was black. The Blackberries, which require more favouring circumstances to bring them to ripeness, but the plants of which are plentiful, were this year almost as abundant as the former, and remarkably large and sweet. The Tytte-berries, which are only found in certain parts of North Greenland, only ripening in certain seasons, were also in fair quantity along the south-east bays.

blubber; they are kept easily underground or in a cold room. Blaa-berries (*Vaccinium uliginosum*) are much less plentiful, and ripen well only in an eastern aspect, and are dependent on the weather of the summer. These also keep well under the snow till the spring, and I have found plenty of them in May at the head of Jakobshavn's icy fiord, just as they appeared after the melting of the snow; but they are soon gone after being thus uncovered. The Greenland Blaa-berries are smaller than those which grow in our (Danish) woods, but pleasanter and sweeter. They are not used by the Greenlanders, who have a sort of prejudice against them and consider them hurtful. There is still a third kind, the Tytte-berry (*Vaccinium Vitis-idæa*), which grows only in the southernmost parts, chiefly around south-easterly bays, and only ripening in fine summers. Further north I have heard of plants, but not of their producing fruit. The berries are not eaten by the natives, and are only turned to use by being preserved with sugar*.

Finally, there are not a few plants which offer their flowers, buds, leaves, or roots, to be eaten either raw or cooked; as the *Sedum Rhodiola*, which only grows south of Egedesmind and on the island Tosak; *Pedicularis hirsuta*, which is plentiful, and the flower of which is cooked like cabbage; *Epilobium* (*E. latifolium?*) the flowering heads of which are also eaten. This grows most freely round the sites of old houses, by the bird-cliffs, or on the sandstone which contains coal-seams; here the thick bushes attain a height of one or two feet. The *Cochlearia* also grows near old dwelling-places and on the outer islands, which are enriched by the birds; as far as we learn, neither of these plants are eaten by the natives. They do however make much use of the Quan (*Angelica Archangelica*), the stalks of which are eaten raw; but this plant has only a limited extent, and except in the southern parts, it is only met with on the island of Disko, helping to confirm the story that goes of this island, that Disko was torn from a more southern land, and conjured by a sorcerer into its present position. Iceland Moss (*Cetraria Islandica*) is found everywhere, though in greatest abundance on the outer islands of the southern districts, probably from their abounding most in moisture and fog. The Greenland Moss is consi-

* On the whole, it appears that North Greenland has a dry, rather than a damp climate. The distribution of moisture is not unworthy of notice. Its outer coasts have more of the fogs and raw cold weather, and this explains why the berries always ripen better within the fiords and up Disko Bay, even close up to the inland ice, than on the outer western islands.

dered of an inferior quality to that which grows in Iceland, but it is the same plant.

And the sea also helps out the food of the Greenlanders, by whom three or four kinds are eaten. This is the vegetable food, to which they have recourse in time of need, and especially the sort called Aukpadlartole, or "the red." It is said in another place that the sea, along the coasts of Greenland, nourishes a growth of weeds which resemble marine groves, some kinds having leaves of six or eight ells in length and a quarter of an ell in breadth, and filled with living creatures.

BOTANICAL INFORMATION.

RHODODENDRONS *of Sikkim-Himalaya.*

The 'Kew Garden' Miscellany may well feel an interest in the flowering of the various Rhododendrons introduced by Dr. Hooker to that establishment, and thence widely distributed. Their number and beauty, their peculiar native localities, at different elevations (from 5000 feet to 18,000 feet) of the loftiest mountains in the world, together with the fact of some of them being epiphytal, have occasioned various speculations on the part of Horticulturists regarding the success that might attend their cultivation in Europe. There were not wanting those who questioned the accuracy of the representations of those species most remarkable for the size and beauty of their flowers. In less than three years from the time of the introduction of the first seed that was received, not a few of the above-mentioned doubts and queries have been answered or set at rest; and *that* one which of all others it was most desired to see flourish here, which from the size of its flowers (4½ inches across the mouth) may be considered the gem of the collection, while as an epiphyte (for the trees at Sikkim were loaded with it) it was the most despaired of, the *Rhod. Dalhousiæ,—that* has already, by the skill of an accomplished gardener in Scotland, been brought to flower, with blossoms quite equal to what have been seen and described in the native country of the plant. Five distinct species have already produced blossoms (the more easily because cultivated in a cool green-

house or frame; but we may observe that at Kew many of the species have survived two winters in the open borders, generally sheltered by other shrubs, and all that are in cultivation, one winter, viz. that of 1852–3,—a season not a little trying to many delicate plants. Those which have already flowered are as follows:—

1. The first with us was in the spring of 1852, the *R. ciliatum*, Hook. fil. Sik. Rhod. tab. 24, and figured from our plant in Bot. Mag. tab. 4648; and this is now (April 1853) showing flower-buds in the open border, we believe in several gardens: and further, during the present month, in a cool greenhouse with us, a group of fifteen to twenty of these plants, from six inches to a foot high, in pots, is a mass of flowers, a perfect picture, varying exceedingly in the colour of the corollas, from the purest white to deep lilac, though none is so deep as the usual colour of the flower in Himalaya.

2. The *R. lepidotum*, Wall., to which should be united *R. elæagnoides* and *R. salignum*, Hook. fil. Sik. Rhod. tab. 23, and *R. obovatum*, ejusd.

3. *R. Dalhousiæ*, Hook. fil. Sik. Rhod. tab. 1 and 2.—The great merit of having flowered this glorious plant is due to the skill of Mr. Laing, Gardener at Dysart House, Kirkaldy, N. B., and mainly perhaps to its having been inarched upon a tall plant of *R. Ponticum*. Its noble flowers were produced in a cool greenhouse in March of the present year; and our figure, which will appear in the June number of 'Botanical Magazine,' will show that it is no way inferior to the representation given by Dr. Hooker, quoted above, differing indeed somewhat remarkably in colour from the *native* plant, for whereas *that* has usually a delicate tinge of pink, this is suffused with an equally delicate tinge of full or almost orange-yellow. The scent is delicious, compared to that of lemons, or rather perhaps the lemon-coloured *Verbena*. We believe Messrs. Standish and Noble have inarched some of their plants, and are expecting the like success to result from the operation. In East Nepal and Sikkim it grows at elevations varying from 8000 to 10,000 feet; and there seems no reason why it should not prove quite hardy with us.

4. In the present month, April 1853, *R. glaucum*, Hook. fil. Sik. Rhod. t. 17, is flowering well, and is remarkable for the glaucous colour of the underside of the leaves and for the great development of the calyx. The corolla is about an inch long and as much broad, and the flowers grow several together at the ends of the branches. Its range in

Sikkim and Bhotan is 10,000 to 12,000 feet. This will be figured in an early number of the 'Botanical Magazine.'

5. *R. niveum*, Hook. fil. Sik. Rhod. Consp. Sp. p. 4. n. 21.—Almost while I am writing these notes, I receive information from Messrs. Standish and Noble that Dr. Hooker's *R. niveum* is now in flower with them at Bagshot. The blossom has not yet been seen by us; nor did Dr. Hooker find it in flower in its native country; so that he has given no figure of it, and has derived the character from the foliage and fruit. The former is covered beneath by a snow-white tomentum, unlike the silvery compact clothing of *R. arboreum*, and the capsules are shorter, more cylindrical, and more blunt than in that species. It inhabits Sikkim-Himalaya, at elevations of from 10,000 to 12,000 feet above the level of the sea.

Extracts from the Report on the Royal Botanic Garden at Peradenia, Ceylon, from October 1851, *to September* 1852, *inclusive; by* G. H. K. Thwaites, Esq., Superintendent.

Every attention has been given, during the past year, to keeping the drives and walks in good repair. The lake now contains several species of water-lilies, including a healthy young plant of the gigantic *Victoria regia*, raised from seed received from Kew. A number of species of indigenous trees are being raised from seed, and planted out upon the grass, as they become large enough for that purpose; and in the course of a few years, an extensive and highly interesting Arboretum will in this way be formed.

The flower-borders have received their due attention, and exhibit a decided improvement, owing to the removal from them of useless trees with which they were encumbered.

Seeds of the best varieties of Cotton have been sent to various parts of the island; and it is to be hoped and expected, that it will be found to succeed where the climate is more certain, and therefore more suitable for its cultivation, than in this immediate locality; the experiment made in this Garden with Cottons having failed entirely this past season, owing apparently to the unfavourableness of the weather. A strong desire has been manifested by some of the Kandyan population to take up the cultivation of Cotton; and at the request of a native

gentleman I prepared a short paper on the subject, which was translated into Singhalese and distributed. In my next Report I hope to be able to give some account of the trials made by the natives of the Central Province in Cotton cultivation.

Having obtained from England a small quantity of Shiraz Tobacco-seed, plants were raised from it as soon as possible, and the fresh seed produced from them extensively distributed; and from Chilaw I have had the pleasure to receive a very favourable account of it. In that place it is likely to supersede the kind previously cultivated, as it is acknowledged to be very superior in quality. Other varieties of Tobacco are now being raised from American seed, presented by a liberal contributor to the Garden.

It has afforded me satisfaction to find, from an article published recently in a Colombo newspaper, that seeds of the best kind of Senna, which I sent to a gentleman residing at Putlam, have succeeded well there; and the plant would no doubt grow equally well on the sea-coast generally of the island.

The plants of Manilla Hemp referred to in my last Report are growing well, and in a short time may be divided for distribution to a small extent. The Vanilla plants are in a very healthy condition, and one of them produced flowers during the past year; and I hope that, before long, "pods" will be obtained from the plants.

In order to ascertain whether the inferiority of the Ginger produced in this country to that obtained from the West Indies, arises from the latter being a superior variety of the plant, or from more care being bestowed on its cultivation, I have obtained, through the kindness of a gentleman who has lately arrived in England from this island, a small supply of West Indian Ginger in a growing state. This has been planted in the Garden, and will be cultivated under exactly similar conditions with some of the native Ginger, and the produce of the two kinds carefully compared.

In addition to numerous ornamental plants received during the past year from the Royal Botanic Garden at Kew, I have to record the acquisition of six prime varieties of Pine-apple, all of which are looking well, and likely to succeed. Amongst interesting plants received from various sources, I must not omit to mention growing specimens of the true Cochineal Cactus (*Opuntia coccinellifera*), presented by the same gentleman to whom the Garden is indebted for the Manilla Hemp plants.

Packets of seeds have been received from the Royal Botanic Garden at the Mauritius, and from similar establishments in India; and a valuable collection is expected to arrive shortly from a gentleman residing at Sydney, New South Wales.

Care is taken to keep up a good supply of young plants to meet the demand, both of fruit-trees and of ornamental species; and every possible addition is made to the number of desirable kinds for distribution.

A considerable addition has been made to the Herbarium, of new and interesting plants, collected during two excursions into the jungle. Most of these I have been enabled to have sketched whilst they were in a fresh state, from being allowed to employ an Assistant Draftsman, agreeably with the request made in my last Report.

Thinking it very desirable that this establishment should possess specimens of the various vegetable productions of the island, I have commenced the formation of a Museum, to comprise specimens of woods, gums, fibres, starches, and other substances; intending also, in order that these productions may be known in England, to forward duplicates of the same to the new Museum attached to the Royal Botanic Garden at Kew; and to distribute other spare specimens in a way most likely to promote the interests of the Colony. Such a collection as I have indicated will prove of much value here, in connection with a well-arranged Herbarium, for reference to the species producing the respective substances; and it will give additional interest to the valuable collection of drawings now in this library, and which are daily being added to.

To Dr. Wight of Coimbatore, the talented author of various works on Indian Botany, I have again to express my obligations for much assistance in furnishing me with the names of many of the plants I have sent him, which had been already described; thus saving me the time and labour of searching out this information from books and other sources.

The publication of a Flora of Ceylon is kept constantly in view, and I am preparing materials for it; but in the present state of the science of botany this requires a vast amount of research, and to be properly and usefully, cannot be hurriedly, accomplished. It is my intention however, before very long, to publish some short general account of the contents of the Herbarium, which now comprises between two and three thousand species of indigenous flowering-plants and ferns. In 'Hooker's Journal of Botany' I have recently published descriptions

of the "Doon" (*Doona Zeylanica*, Thw.), and "Wenewell" (*Pereiria fenestrata*, Lindley): the first likely to become of economic value, as yielding an excellent Gum-resin; and the latter of medicinal importance, as a substitute for Calumba-root.

Having already, in a communication to Government, drawn the attention of the Chamber of Commerce to the Doon-tree just referred to, as well as to the "Gokatoo," or true Gamboge of commerce, it is unnecessary for me to repeat here what I then said; but I would observe that I lose no opportunity of making inquiries respecting the productions of this country; and during my excursions into the jungle the chief objects of my search are such plants as are likely to prove of direct value.

I have collected several species very closely allied to the Gutta Percha tree, but have not yet found the true one, though it is far from improbable that it may occur here, or some allied species possessing the same properties.

In concluding this Report, I would take the liberty of suggesting how important might be the result of the encouragement by Government, in different parts of the island, of such experimental gardens as the one contemplated at Kurnegalle. These gardens might be supplied with plants and seeds from this establishment: and I should consider it my duty, and it would be a very gratifying one, to render all the assistance in my power to such undertakings. This would seem to be the best, if not the only plan, of introducing to any extent amongst the native population, improved varieties of plants and better modes for their cultivation.

India-Rubber.

(From the 'Singapore Local Reporter,' August 7.)

A produce of Borneo, which we think could be obtained in our island, and from the neighbouring state of Johore, has been brought to market here within the last few months; and although the quantity imported was trifling, from all the information we have collected and from our own personal observation, we are led to believe that in a short time this article will constitute an important part of our local trade; for according to letters in our possession, received from persons well acquainted with the matter, it has been ascertained that Messrs. M'Intosh

in England, and different eminent manufacturers in France and Germany, have declared that the kind of *Gum elastic* forwarded for their examination from Labuan and the north-west coast of Borneo, was of *very much greater value* for the purpose of making waterproof fabrics than any other variety of caoutchouc.

This gum, the produce of creepers known in that part of Borneo under the names of *Serapit*, *Petaboo*, and *Menungan*, is nothing else than the watery, milk-like sap of these creepers, which by a simple process, in the addition of a little salt water, takes the consistency and all the peculiarities of real India-rubber, being at first snow-white, but by exposure to the air changing slowly to a dirty yellow, and afterwards brown colour. The *Serapit* produces the most common, the *Petaboo* the best, the *Menungan* the greatest quantity of, sap. The gum obtained in this way contains water, enclosed in small cavities, which we believe to have been formed by the celerity with which the sap hardens, preventing thereby the salt water and perhaps the watery part of the sap from finding an issue. * * *

During our peregrinations in the jungle of Singapore, we have met with the identical creeper, called *Menungan* in Borneo, but which the Malays here call *Ngerit* or *Ngret*, and on inquiry have heard from native woodcutters that the same is found in great quantities in Johore and the neighbouring islands. We therefore believe that this discovery is well worth the trouble and the expense of an experiment on a limited scale, the gum having been sold here from 8 to 11 dollars the picul.

The process for obtaining the sap in use by the Badjows and Muruts is very simple; but we should like to see an attempt made to obtain it in a manner less destructive to the plant. These people cut the creeper into small pieces of one foot to eighteen inches in length, allow the sap to flow into their jars or buckets, and put one end of the piece over a slow fire, whenever the sap does not flow quickly enough. They therefore destroy the plant in order to obtain the juice.

This creeper could also form a new branch of agriculture, for it grows fast enough to procure a supply of the sap in less than three years, and after planting requires no further cultivation.

[We heartily wish our friends at Singapore, as well as in Borneo, would send dried flowering specimens of these and other useful plants to the botanists in Europe, that their scientific names may be determined.—Ed.]

NOTICES OF BOOKS.

Mémoire sur les RAFFLESIAS ROCHUSSENII *et* PATMA; *d'après les recherches faites aux îles de Java et de Noessa Kambangan, et au Jardin de l'Université de Leide; dédié à Son Excellence M. J. J. Rochussen, Ministre d'Etat, ancien Gouverneur-Général des Indes Orientales Néerlandaises, etc. etc. Par* W. M. DE VRIESE. Folio. Leyden, 1853, with two imperial folio plates.

Our friends the Dutch botanists are making an excellent use of the noble botanical collections from their fertile Malayan colonies in the east, the island of Java in particular. Dr. and Professor De Vriese stands pre-eminent among the authors on Javanese Botany, and his office, as Professor of Botany and Director of the Botanic Garden of the University of Leyden, occasions large collections to be placed at his disposal. The Memoir which we are now considering may be looked upon as supplementary, as far as relates to *R. Rochussenii*, to the account of that species in a letter to Robert Brown, Esq., published in this Journal, vol. iii. (1851) p. 217; and as far as regards *R. Patma*, to the excellent memoir, with figures, of Dr. Blume. In a graceful dedication to the late Governor-General of the Dutch Possessions in the East, Dr. De Vriese says: "Si jadis M. Brown, le plus célèbre Botaniste du XIXme siècle, en publiant la description de la fleur la plus gigantesque qui ait excité la curiosité du monde entier, la dédia à juste titre à Sir Stamford Raffles, il n'est pas étonnant sans doute, que ceux qui ont découvert l'espèce, dont je me propose de tracer l'histoire, y ont donné le nom de Votre Excellence, en faible mais sincère hommage de leur respect et de leur reconnaissance, pour les bienfaits et les secours qu'ils ont éprouvés de la part du Gouvernement, et de la personne de Votre Excellence." Besides a full description of *Rafflesia Rochussenii* and *Rafflesia Patma* (mas. et fœm.), here are many interesting extracts given from letters of Messrs. Binnendijk, Teysmann, Khorthals, and Junghuhn. The latter speaks of the vegetation of the island of Noessa Kambangan:—"Là ou les troncs des arbres ne couvrent pas le sol, on trouve une riche végétation de fougères, parmi lesquelles on remarque surtout le grand *Polypodium longissimum*, Bl.; c'est là que se trouve aussi la *Nepenthes phyllamphora*, Willd. Les Javanais disent, quoiqu'à tort, que dans les ascidiums de cette plante se

trouvent de petites écrévisses. Dans ces mêmes endroits se développe sur les racines des figuiers la *Balanophora alutacea*, Jungh. C'est là que les tiges ligneuses de plusieurs *Cissus*, avant de s'élever au troncs et aux sommets des arbres, servent pendant leur course à travers des touffes de fougères, entre lesquelles ils s'étendent, souvent jusqu'à cent pieds de longueur, de matrix à Pidêmo, *Rafflesia Patma*, et à *Brugmansia Zippelii*, Bl. La dernière fut trouvée à une hauteur de 1000–1500′ sur le *Cissus verrucosa*, Steudel (tuberculata, *Bl.*). La première, au contraire, se trouve sur des tiges du *Cissus scariosa*, et en particulier dans le voisinage de la côte du sud. Les Botanistes qui n'ont pas étudié le règne végétal dans son état naturel et vivant, et qui n'en ont puisé leurs connaissances que dans les échantillons ramassés et séchés par d'autre Botanistes, comme c'est entre autres le cas avec le Dr. C. L. Blume,—de tels Botanistes, dis-je, ont donné à tort à ces plantes (les *Rafflesiaceæ*, R. Brown) le nom de *Rhizantheæ*, un nom qui conviendrait mieux aux *Balanophorées*. Les *Rafflesiacées*, que je viens de nommer vrais parasites, ne se développent pas sur les racines, mais sur la partie inférieure et ligneuse de la tige du *Cissus*, où il rampe sur le sol humide, ou ne s'élève qu'à 3–4′ au-dessus du sol, et se trouvent souvent à une grande distance de la racine. Nullepart la plante parasite Pidêmo ne croît sur ses tiges en si grand nombre que dans les parties centrales ou méridionales de la côte Noessa Kambangan, où, lorsque je visitai cette île au mois de Mai (1847), je trouvai cette plante dans une telle quantité, que je ne pouvais faire un pas, sans fouler aux pieds quelques individus. Les vieux individus pourrissaient comme des champignons, et formaient alors une matière pulpeuse. Toutes les tiges (du *Cissus*), les plus grosses autant que les plus grêles, plus radiciformes *pour autant qu'elles s'étendaient sur le sol*, étaient couvertes de Pidêmo, comme de petits bourgeons de chou à forme déprimée, que je trouvai dans tous les degrés de développement, tandis que les rameaux de la liane plus élevés et pourvus de feuilles pendaient souvent d'une hauteur de 100′ du sommet des arbres." The plates, with copious dissections, are of the first-rate order, artistically and botanically, and would do honour to any age or country.

Vers h eines Commentars über die Pflanzen in den Werken von Marcgrav und Piso, etc. Attempt at a Commentary on the Plants in the works of Marcgrav and Piso on Brazil; with some further details concerning the Flora of that Kingdom. By Dr. C. Fr. Ph. von Martius. 1. *Cryptogames.* Munich, 1853, 4to. (From Memoirs of the Royal Bavarian Academy of Sciences. Cl. II. vol. vii. sect. 1.) Translated from the German by Dr. Wallich, V.P. Royal and Linn. Soc.

Introduction.

Among the memorials of a dawning literature in the Natural History of Brazil, the writings of Marcgrav and Piso undoubtedly occupy the first place. As the works of the Spanish Gonz. Hern. de Oviedo, and Franc. Hernandez, must be acknowledged to be the primary sources in those respects, with regard to the Antilles and Mexico; so must this praise be conceded to the Dutch Wilh. Piso and the German George Marcgrav, in respect to Brazil. Those two men were the first who exclusively, or at least principally, made the Natural History of the New World the subject of their writings.

The accounts of the discoveries of Columbus, Americus Vesputius, the three reports which were printed of Cortez, the Decads of Petrus Martyr de Anglevia, the historical works of F. L. de Gomara, Pedro de Cieça, Diego de Castillo, Hieron Benzoni, and others, had no doubt furnished much information on the nature and products of that new World, which displayed itself to the astonished Europe as a theatre of wonders; still, leisure, opportunities and knowledge were wanting to those first discoverers, the *Conquistadores*, and their reporters, to undertake and note down any matured and detailed researches regarding natural productions.

So late as the second century after the discovery of America, the curious in Europe had scarcely any other source of information than the original accounts named above, and the numerous translations from them; and compilations, such as Collectio Grynæo-Hervagiana (Novus orbis regionum etc. Basil. 1532, fol.) of the sea-voyages of Ramusio, Hakluyt, Theod. de Bry, Hulsius and others, which, judging from their many editions, were read with interest. Although Portuguese and Spanish travellers and employés frequently furnished many valuable reports on a variety of objects of Natural History, they were

in many instances allowed to remain hidden in the archives*, and if at length printed, found their way but tardily into the eastern parts of Europe. This will account for those misconceptions which have prevailed in Europe, even up to recent times, concerning Nature, and her productions, in those newly discovered territories; founded as they were on the stationary and unsettled information, derived from those early writings, and to which we would add, as a very influential authority, the 'Historia natural y moral de las Indias' of Joseph d'Acosta†. The bearings of those early chroniclers, rather than historians, manifold in their Aristotelian, or else Arabian views, discoloured still more, sometimes, by certain monastic leanings, and bequeathed unaltered by any critical improvement from one generation to the other, have been productive of various erroneous notions and prejudices, which have only recently yielded to sounder judgment and more accurate researches. The writings, however, of Marcgrav and Piso distinguish themselves from all the earlier authors, by their containing little of hearsay matters, but reporting mostly from personal observation, and displaying great and rare candour and impartiality, as well as a strict love of truth. On this account alone they deserve, even at this present time, when we possess the guidance of more matured researches, to be reviewed and made tributary to our common stock of knowledge.

It must be considered, besides, that, before the period of Marcgrav and Piso, the New World had never yet been visited by men of letters *avowedly and principally in order to enrich natural history*. This was especially the object of the former; Piso having purposely engaged him, for the sake of instituting scientific researches, while he himself accompanied the Count Moritz of Nassau in the capacity of body physician, and as director of medical affairs of the new colony and of the troops. Since the mutual relation of these two men, towards each other and to their scientific mission, is so intimately connected with their writings and other labours, it seems proper to premise here, by way of an introduction to this memoir, the essential features of the history of their mission. We avail ourselves on this occasion, of the historical statement furnished by M. Lichtenstein, in his admirable commentary

* For example, the meritorious labours of the Jesuit, Barnabas Cobo.

† The oldest edition at Sevilla, 1590, 4to; the second already in 1591, at Barcelona, in 12mo.

on the zoological labours of our travellers*; the more so, because it will be conducive to a better understanding of what we have to say concerning the vegetable productions.

The Dutch having settled in the Brazils, and at Bahia since 1623, and at Pernambuco in 1630, they were threatened with the loss of the young colony, by the powerful aspirations of the crown of Spain, which had absorbed Portugal and its colonies, when Count Johan Moritz of Nassau-Siegen was deputed, towards the end of 1636, to maintain and organize the possessions of the former. Distinguished alike as the enlightened friend and patron of science, and as a renowned captain, Count Moritz had the command of 2700 men, whom he landed at Pernambuco at the beginning of 1637, being accompanied by a medical man of science, Wilhelm Piso, who brought along with him two young learned Germans, George Marcgrav† from Liebstadt in Misnia, and H. Cralitz. Piso has the following remark on this subject, in the preface to the edition of 1648: "Invitatus quondam ab amplissimis Societatis Indiæ Occidentalis undeviginti viris, ut ill. Nassoviæ Comiti, tum quoque Brasiliæ, qua paret Belgis, in arte apollinari præessem, publicæ utilitatis fore mecum arbitrati sunt spect. viri D. Alb Coenradi Burg et D. Joan. de Laet, primi Musarum fautores, molestam hanc provinciam mihi impositam naturæ indagatione horis subcisivis lenire. Cui simul oneri publico et privato ut ferendo par essem, G. Marcgravium et H. Cralitzium Germanos, medicinæ et matheseos candidatos, mihi adjungi visum est. Hic immatura morte suffocatus, ille sedulus per sexennium mediterraneorum locorum explorator, meis primum mox ill. Comitis subsidiis suffultus, partes suas circa geographicas, astronomicas historiæque naturalis observationes acriter tutatus est. Atque in Africam tandem transfretans succubuit," etc.

Placed in immediate contact with so enlightened and high-minded a prince, our naturalists experienced every possible encouragement. Moritz of Nassau, being a man of great enterprise, and determined to establish himself in that beautiful and rich country, built the palace

* 'Die Werke von Marcgrave und Piso über die Naturgeschichte Brasiliens,' etc. (The works of Marcgrave and Piso on the Natural History of Brazil, explained by means of the recovered original drawings.)—From Transactions of the Royal Academy of Sciences at Berlin for 1814 and 1815, p. 201, etc. (Introd. and Mammalia); 1816 and 1817, p. 155 (Birds); 1820 and 1821, p. 237 (Amphibia); 1826, p. 49 (Fishes).

† M. Lichtenstein calls him Marcgrave in his Commentary; I have retained the more usual spelling, Marcgrav.

Mauritia on an island between the mouths of the Capivaribe and Biberibe (forming at present part of the town of Reciffe), and surrounded it with gardens, in which, besides introduced subtropical and tropical fruits, were also cultivated indigenous useful plants; it contained also a park of native animals*. The Count relieved his hours of relaxation from labours by pursuits in natural history, and together with his court chaplain Franz Plante, appears often to have had Piso about him†. The Dutch dominions extended over the four Capitanias of Rio Grande, Parahyba do Norte, Itamaraca and Pernambuco; also the nearest shores of eastern Brazil, between the fifth and tenth degrees of south latitude. Piso continued near the Count, who was continually engaged in repelling the invasions of the Portuguese in various directions, and even attacking these; while Marcgrav penetrated into the interior of the country. The geographical charts which Barlæus published in his encomiastic report of the deeds of Count Moritz of Nassau, may serve to indicate the distance to which Marcgrav extended his researches inland; for it can hardly be doubted, that those charts were prepared by him, since Barlæus expressly mentions him‡, and no other geographer is alluded to, as having accompanied the Dutch expedition of occupation. According to these documents, comprising the coast from the mouth of the Rio Vaza Barris to the south (11° 11′ S. lat.), to that of Rio Grande do Norte, or Potengi, to the north (5° 46′ 47″ S. lat.), it appears, that Marcgrav had proceeded furthest to the westward, along the rivers Managuape and Capiribi; regions then very sparingly inhabited, to a distance only of eight miles inland from the coast§. The Portuguese had principally settled, besides points along the coasts, in scattered farms on the navigable rivers, by encouragement and support from Albuquerque, the Donatario of

* Barlæus (Rerum in Brasilia gestarum historia, editio major, Amstelod. 1657), who gives a view of Mauritia, and a plan of the grounds, quotes, at p. 144, the following indigenous plants in cultivation on them:—*Carica Papaya*, L. (Papaya Mammaa), *Genipa brasiliensis*, Mart. (Jenepapa), *Caladium Poecile*, Schott (Mangara), *Lagenaria vulgaris*, Ser. (Calabassia), *Anacardium occidentale*, L. (Acajousia), *Byrsonima verbascifolia et aliæ species* (Cerasa brasiliana), *Anona Marcgravii et A. Pisonis*, Mart. (Aratuca), *Musa* (Bacova s. Banana), species of *Cereus* (Sempervivæ), *Tamarindus indica*, etc.

† Barlæus, p. 331.

‡ "Tabulas geographicas magna cura et sumptibus suis exarari fecit auctore G. Marcgravio, cujus in gratiam exstrui in sublimi speculam fecerat Nassovius."—Barlæus, p. 330.

§ Barlæus, p. 317.

the province of Pernambuco. Count Moritz availing himself in a like manner of his position, procured accounts and natural productions, through seafaring men, of the Dutch settlements on the west coast of Africa, and of Chile. After a sojourn of seven years he brought home the richest collection of natural productions, that had ever been taken to Europe by one importation*.

Very many natural objects, both animals and plants, were painted on the spot†. M. Lichtenstein, the distinguished commentator on the zoological harvest of the expedition, gives no hint as to the name of the painter; nor is it mentioned in any of the written documents. It strikes me as probable, that the oil-paintings are by Franz Post, son of Johannes, a painter on glass at Harlem, whom the Count summoned over to Brazil‡, and who became known by his numerous landscapes in oil, in which he indulged in tropical scenery, and represented particular tropical animals and plants§. This artist, as well as Piso, returned with the Count to their native country; but Cralitz died soon after arriving in Brazil, and Marcgrav fell in 1644, at the age of thirty-four years, the victim of an epidemic fever, at S. Paulo de Loanda in Angola, whither he had gone across, in order to continue his astronomical and natural-historical researches.

The literary harvest of the expedition was of a threefold description: 1, Marcgrav's astronomical observations; 2, his and Piso's other manuscript notices, and 3, figures in natural history, partly in oil and partly in watercolours. The astronomical portion‖, transferred by the Count to the Leyden astronomer Golius, was not published, and appears to

* So ample were these stores, that the cabinet of the Prince, the Museums of two Universities, and several private collections (among others what became subsequently Seba's) were enriched by them; and during more than a century has natural science drawn on them.—Lichtenstein in Trans. of the Academy of Berlin, 1814 and 1815, p. 202.

† "Imagines ad vivum a pictore mecum per mediterraneas solitudines peregrinante expressas adjunxi."—Piso, ed. 1658, p. ii.

‡ Compare Fuessli, II. p. 1145. Fr. Post was born at Harlem in 1624, and died there in 1681.

§ Two landscapes by this master, representing Brazilian scenery, are preserved in the Royal Gallery of Paintings at Schleissheim, formerly at Munich (Cat. n. 1510 and 1512). In my 'Historia Palmarum,' tab. 84 and 95, part of that scenery has been repeated. Barlæus has likewise many landscapes and marine representations with the name Fr. Post (not Poost) attached, mostly of the year 1645.

‖ Said to have comprised a description of the constellations of the southern he-

have been lost. The remainder of what Marcgrav left behind, which was mostly written with symbolical characters invented by himself, together with Piso's writings on the climate, diseases, poisons and medicines of the most frequented regions, were transferred to the hands of the learned doctor Joan. de Laet, author of the richest compilation from the early writers on South America*, as Piso had no leisure for arranging and publishing them. Laet published these manuscripts, availing himself of the paintings which had continued in the Count's possession, and enriching them with his own additions, under the title: *Historia naturalis Brasiliæ, auspicio et beneficio ill. J. Mauritii, Comitis Nassoviæ*, etc., Amsterd. 1648, fol. This work contains separate accounts of the labours of our two travellers. Piso's are in four books; de aere, aquis et locis, de morbis endemiis, de venenatis et antidotis, and de facultatibus simplicium, under the common title: de Medicina Brasiliensium. Marcgrav's materials appear under the general title: Historia rerum naturalium Brasiliæ, in eight books, of which the three first relate to plants; the fourth to fishes; the fifth to birds; the sixth to quadrupeds and snakes; the seventh to insects, and the eighth to the country and its inhabitants; followed by an appendix, de Tapuyis et Chilensibus. Of the paintings placed at his disposal, woodcuts were taken, probably at the expense of the Prince, in order to accompany the text in their proper places; but these figures want frequently that sharpness and elegance, which belong to contemporary productions, and still more so those of a still earlier period; and M. Lichtenstein's censure in this respect, as regards the zoological figures, applies equally to the botanical. The business of the edition was, in fact, not performed with the requisite accuracy and care; for "besides that the originals frequently admit of greater precision in their outlines, several figures are appended to the text in wrong places†." It happens not rarely that the same figures appear in the works of both authors. A note of Laet (to *Dodonæa viscosa* in Marcgrav, Hist. Plant. p. 76) makes it, moreover, probable that Marcgrav had a herbarium, from

misphere; a new theory of the lower planets; the doctrine of refraction and parallaxes, a theory of the determination of longitude, and a dissertation to ascertain the true dimensions of the earth. Lichtenstein, l. c. p. 203.

* Novus orbis s. descriptionis Indiæ orientalis, L. xviii. Lugd. Bat. 1633, Fol. (Dutch edition, 1625, French, 1640.)

† Lichtenstein, l. c. p. 203.

specimens of which the editor may have obtained many of the woodcuts; but of this herbarium, left by Marcgrav, no trace has been found, either in the Netherlands or in Germany*.

* A strong, though not accurate recollection, of having seen the herbarium, nearly half a century ago, at the library of the Royal Botanic Garden at Copenhagen, induced me to apply on the subject to my much-valued friend Professor Liebmann, who immediately and with his accustomed liberality favoured me with the following interesting particulars. "Marcgrav's herbarium consists of one folio volume, and as such forms an entry in the old garden catalogue. It has King Frederick the Third's cypher on the title-page, thus:—

and was consequently his private property until, on his death, it became the property of the Garden. It is in perfect preservation, not having suffered in the smallest degree from insects: which must be attributed to the specimens being firmly and completely glued to the sheets. They are however, in part, very incomplete, being leafless branches, or leaves only; but the majority are easily determinable. All the remarks in Joannes de Laet's edition of Marcgrav and Piso's *Historia Nat. Brasiliæ*, relating to the figures being taken from the plants in Marcgrav's herbarium, are entirely confirmed by the herbarium itself; the figures being executed from the originals contained in it. This circumstance imparts to this small collection its chief importance; since, in most cases, it would not have been possible to determine with certainty, without consulting the herbarium, those plants which admit of being recognized by the figures and descriptions alone.

"The title of the collection is *Herbarium vivum Brasiliense plantarum et fructuum a viro clarissimo Domino Georgio Marcgravio de Liebstad Misnic. German. in Brasiliana insula singulari studio collectarum et observatarum.* The volume consists of 173 folio leaves. With the view of giving some idea of the contents of the herbarium, I have made the following rapid list of the genera:—

n. 2 Mimosa sensitiva
3 Melastoma
4 Manihot Aipi
5 pinna Cocos nuciferæ
6 fol. Ananassæ sativæ
7 Guilandina Bonduc
8 Mimosa
9 Passiflora
10 Chrysobalanus Icaco
11 Ditto, ditto
14 Tournefortia
15 Baccharis
16 Solanum
17 Alternanthera
18 Epidendrum
19 Inga
21 Lastrea
23
24
25 Melastoma
26 Pontederia
27 Ditto
28 Conocarpus
29 Dorstenia
30 Conocarpus
31 Hibiscus
32 Clusiacea
33 Amarantus
34 Artanthe
36 Crotalaria
37 Guazuma
38 Ditto
39 Psychotria
40 Bumelia
41 Sloanea
42 Solanea
43 Inga
44 Carica Papaya
45 Ruellia?
46 Melastoma
48 Clusiacea
49 Mimosa
50 Crescentia
51 Combretum
54 Cucumis
55 Spigelia
56 Cucurbita
57 Abrus
58 Tamarindus
59 Physalis
60 Sida?
61 Physalis
62 Jussieua
63 Solanum
64 Cardiospermum
65 Ditto
66 Scoparia
67 Nyctaginea
68 Ditto
69 Indigofera
70 Hirtella
71 Cassia
72 Capraria
73 Lomaria
74 Euphorbia
75 Ocymum
76 Cedrela
77 Cassia
80 Eriocaulon
81 Cissampelos
83 Portulaca
84 Serjana

Not satisfied with the execution of this work*, Piso revised his own as well as Marcgrav's materials, and, adding the six books of Jacob Bontius's *Historia naturalis et medica Indiæ orientalis,* published the whole in 1658, also from Elzevir's press, under the title: *Guil. Pisonis de Indiæ utriusque re naturali et medica, libri quatuordecim,* fol. Marcgrav's botanical labours do not appear separately in this work, but are interwoven with Piso's. The first book treats of the climate; the second of the diseases; the third of the animals: the fourth of the plants, and the fifth of the poisons and antidotes. Then follows of Marcgrav only his *Tractatus topographicus et meteorologicus Brasiliæ, cum observatione eclipsis solaris,* and his *Commentarius de Brasiliensium*

85 Phaseolus?
86 Ditto
87 Anacardium occidentale
89 Inga
90 Glycine
91 Phaseolus
92 Rhynchospora
93 Desmodium
95 Mimosa
96 Ditto
97 Cassia
98 inflor. Palmæ
99 Mimosa
100 Melastoma
101 Paullinia
102 Sponia
103 Desmodium
104 Portulaca pilosa
105 Andropogon
106 Cyperus
107 Leptochloa
108 Panicum
109 Sporobolus
110 Leptochloa
111 Dichromena
112 Digitaria
113 Corallina
114 Leptochloa
115 Cecropia
116 Graminea
117 Cassia
118 Ditto
120 Kyllingia
121 Tephrosia
122 Philodendron
123 Convolvulus
124 Stemodia?
125 Composita
127 Hirtella
129 Urena
130 Tribulus
131 Clitoria
132 Malvacea
133 Borreria
134 Ditto
135 Lygodium
137 Sida
138 Rubiacea
139 Crotalaria
141 Corchorus
142 Cardiospermum
143 Phaseolus
144 Croton
145 Gomphrena
146 Cephaelis
147 Cardiospermum
148 Talinum
149 Croton
150 Xyris
151 Convolvulus
152 Elythraria
153
154 Clitoria
155 Rivina
156 fol. Desmodii
157 Visnea
158 Mimosa
159 Polygonum
160 Ricinus
162 Helianthus
163 Ardisia?
164 Ionidium
165 Jatropha Curcas
166 Smilax
170 Elythraria."

To the above details in Professor Liebmann's letter I may add that he tells me, what I had utterly forgotten, that there are two loose leaves in the volume in question, containing my own juvenile (and no doubt most miserable) attempt to determine the plants in the herbarium.

My friend Mr. Bennett, the Secretary of the Linnean Society, has pointed out to me two specimens of Brazilian plants, in the 240th volume of Sir Hans Sloane's Herbarium at the British Museum, inscribed in his own handwriting "*Mangle. Dr. Hawley, Brazil,* 169–;" and "*Inga, Brazil.*" In the list prefixed to the volume, the name of the illustrious astronomer, who collected these specimens, is correctly spelt Halley.—N. W.

* In the preface to the second book he pronounces the Historia Naturalis Brasiliæ "nimis præcipitanter per meam a prælo absentiam in lucem protrusa."

indole et lingua. The other half of the work is occupied by Bontius's six books; and concludes with Piso's *Mantissa aromatica*, which however relates chiefly to East Indian products, those of American origin, which are treated in detail, being *Anacardium occidentale* and *Theobroma Cacao*.

Piso's undoubted merits in the natural history of Brazil, seem to have been not so much enlarged by this second edition, as he has exposed himself to the reproach of placing those of his fellow-traveller and labourer in the shade. In uniting together materials both from the Old and the New World he may perhaps have adopted as a model the *Libri Exotici* of the celebrated Clusius, published half a century before; but he wanted, as regards the botanical portion, the thorough critical knowledge, which so justly distinguished that most eminent botanist of the age. Neither in arrangement nor judgment did the new edition gain anything; the originality of a first account has been lost here and there; and while various important notices of Marcgrav are entirely omitted, or unjustly slighted, remarks and even figures were added to the first edition from other works, or the volume of Laet (who knew the labours of Clusius, Hernandez, Oviedo, Monardes and Garcia ab Horto, and made use of them) which were entirely out of place as not at all belonging to the plants of Brazil. Thus f. i. under Anhuiba (*Myristica*), p. 146, is quoted the North American Sassafras, with a figure attached, from Joh. Bauhin's *Historia* (vol. i. of the year 1650, p. 483, and thence in Chabræus of 1666, p. 36); and the Brazilian tree Ibiraee, *Chrysophyllum Buranhem*, Riedel (*Ch. glycyphlœum*, Casaretto, Decad. Nov. Stirp. Brasil. p. 12. n. 7), is taken to be *Guajacum officinale* from a remark of Laet in the first edition.

(*To be continued.*)

Botanical Objects communicated to the Kew Museum, from the AMAZON RIVER, *in* 1851, *by* RICHARD SPRUCE, ESQ.

(*Continued from* vol. ii. p. 76.)

1. Seeds of *Guaraná* (*Paullinia sorbilis*, Mart.). From the Rio Negro.

2. Rock from the Cachoeiras of the Rio Aripecurú; the surface eaten into holes by a *Podostemacea*, which has grown upon it.

3. *Pindoba* Palm (*Attalea compta*, Mart.). Spathe, spadix, and fruit.

4. Fruit of a *Lecythidea*, from the Cachoeiras of the Rio Aripecurú. This fruit, when gathered, had an exceedingly aromatic arillus, which the ants speedily devoured.

5. Fruit of a *Lecythidea*, from the Cachoeiras of the Rio Aripecurú.

6. Fruit of some tree, from the Cachoeiras of the Rio Aripecurú.

7. *Cédro* (Icica, sp.?): bark and leaves. Forests on the Rio Trombétas.

8. *Bacába* Palm (*Œnocarpus Bacaba*, Mart.). Marshy forests, near Santarem. From the fruit of this palm an oil is extracted, which burns very clear; a wine is also made from it nearly equalling that of the *Assai*, but much paler.

9. Burnt bark of *Caraipé*. In this state it is mixed with clay to make the fire-proof pottery.

10. Fruit of some *Cucurbitacea*, cleared of its pulp by the ants, and used as *gun-wadding* by the Indians and others on the Rio Tapajoz.

11. Seeds of a twiner called *Pão de Sobão* (apparently some *Euphorbiacea*), with the thin pulp of which a lather is speedily raised. In the interior the settlers often use it for shaving, but I have not yet been able to get a sight of the plant.

12. *Cunhaï* Palm: leaves, spathes, spadices, and fruit. Shady forests near Santarem. Slender Palm of 8–12 feet high; the stem smooth and annulate only in the upper part. (*Cunhaï*, in Lingoa Géral, means "little woman.") Vix *Syagrus cocoides*, Mart.?

13. *Jará* Palm: leaves, spathes, spadices, and fruit. Santarem, on the shores of a small lake. Humble Palm, of from 6–14 feet high; the stem clad with the persistent bases of the leaves, as it were, with a network of fibres. The stems are much used as palisades for gardens and quintals. Conf. *Leopoldinia pulchra*, Mart.

14. *Sucu-uba* (*Plumeria phagedænica*, Mart.). Open sandy campos at Santarem. Small tree of 20–30 feet. The milk, which is very abundant in every part of the plant, is considered an excellent vermifuge. (Wood, fruit.) Herb. 356.

15. Shell of the *Cupu-assú*. This is filled with seeds enclosed in a subacid pulp, from which an excellent lemonade is prepared. The tree is lofty; it is wild near Pará, but at Santarem occurs only in the Roços.

16. *Sipó de Chumbo* (*Cuscuta racemosa*, Mart., or some allied species). In this form it is sold in the tabernas as a remedy against inflamed throats and similar disorders. The plant is common on the campos of Santarem, trailing over various shrubs: it is no. 312 of my collection.

17. Wood and leaves of a Laurineous tree, one of the many "Loüros" of the Brazilians. Forests on the Rio Caipurú. The timber is yellowish, close-grained, and durable, and much esteemed for cabinet and other work. Herb. 571.

18. *Itaüba preta* (a *Laurinea?*): wood, bark and leaves. Forests south of Santarem. The timber of this is considered superior to that of any other in Brazil for the purpose of ship-building. Herb. 669.

19. *Itaüba amarella.* Growing with the black *Itaüba*, of which it seems to be merely a variety.

20. Wood of a *Rubiacea*, a small tree on the campos of Santarem. Herb. 358.

21. Wood of a *Malpighiacea*, a small tree, resembling the *Cajú* in habit and in the form of its leaves. Santarem. Herb. 320.

22. Wood of an *Anonacea.* Shrub or small tree. Campos of Santarem. Herb. 442.

23. *Cajú* (*Anacardium occidentale*, L.): wood. Santarem.

24. Tapuya work-basket, made by Indians at Santarem, on the Amazon, of the young leaves at the apex of the *Tucumá* Palm. The usual furniture of these baskets is a small stock of needles and thread, tobacco, flint, steel, and tinder-box. Should the proprietor be a *lady*, the contents are still precisely the same.

25. *Mari-marí* (*Cassia Brasiliensis*, L.): leaves and pods. The seeds are enveloped in a sweet edible pulp.

26. Fruit of *Piúm*, a twiner (evidently Euphorbiaceous) which I have not yet seen. The Indians use the seeds medicinally: the thin white inner skin being peeled off, they are roasted, and three or four of them form a violent purge. Santarem.

27. Wood of *Uaitá*, a large tree, of which the heart-wood alone is used, chiefly for walking-canes. The fragment sent I procured of an Indian, who was fabricating a knife-haft of it. Rio Caipurú.

28. Wood of *Paracu-uba.* The hard heart-wood chiefly is used for cabinet-work. From the chips a medicinal tea is prepared. Rio Caipurú.

29. *Castanhas de Sapucaya* (seeds of a *Lecythis*, but certainly not of *L. ollaria*, if, as Lindley says, the seeds of that tree "leave a bitter, unpleasant after-taste in the mouth." These are delicious, resembling in taste the sweetest filberts, and are much preferred by everybody to the common Castanha, the fruit of *Bertholletia excelsa*). Rio Curuá, north of the Amazon.

29 *bis*. Wood of *Sapindus*, sp. Herb. 777.

30. Wood of *Murixí* (*Byrsonima*, sp.).

30 *bis*. *Geonoma*: stem, leaves, spathes, and spadices. Male flowers red; anthers *innate*; the two lobes *separate* even in æstivation, when they are *folded down on the filament*, afterwards horizontal or ascending, diverging. (Compare with a *Geonoma* previously sent from Pará.) Santarem, by the Igaripé d'Urumarí, April, 1850.

31. *Palmæ* an genus novum? Leaves, spathes, spadices, fruit, and part of stem. Caudex 8–12 feet high, leafy only at the apex; leaves of about *thirty-six pairs* of leaflets; spadices from among the leaves, simple or (*very rarely*) with one short branch near the base, thickly clad with fruits, which are vermilion when ripe. The most remarkable character is that in the ripe fruit the outer covering* splits up into six (rarely seven) subequal pieces, resembling an expanded flower of six petals, and allowing the stone to fall out. Besides this there is the peculiarity of the inner spathe forming an ochrea around the lower half of the rachis.—Santarem, forest near the Igaripé d'Urumarí, April, 1850. I can find no *Astrocaryum* or *Bactris* in Kunth at all like it.

32. *Curuá* Palm: leaves, spathe, spadix, and fruit. Santarem, moist shady forest. I am not satisfied that this is *Attalea spectabilis* of Mart., but it is what is here called *Curuá*. The kernel is good eating, but very hard. The leaves are used as those of the *Pindoba*, for thatching, etc. (The fruit and spathe were sent in April last, probably without number.)

33. Pods of *Inga-chichí*. Santarem. (Flowering specimens of this are in my collection from Pará.) The cottony pulp which envelops the seeds is eaten; it has a sweetish, subacid taste.

34. *Arvore de Frécha* (Arrow-tree). *Uy'ba*, Ling. Géral. *Gynerium*, sp. Growing in large beds on the Ilha de Mari-mari-tuba, in

* Epicarp and mesocarp.

the Amazon, between Santarem and Obidos. The whole height of this was 20 feet, and it was cut off close to the ground. The five pairs of ropes which hold it down to the earth would seem to be scarcely needed in the dry season; but in the wet season, when from 5 to 15 feet of its stem are under water, and the river sweeps along with great fury, it is obvious that without their stay the plant must speedily be uprooted. The length of stem here sent is 7 feet 8 inches. Nearly the same length (having on it the bases of the crowded distichous leaves) was appropriated as a broomstick by an honest neighbour. Above this was the "frêche," the naked stalk of the panicle. Lastly, at the summit was the noble mane-like panicle, clad with myriads of purple-and-silver flowers.

35. Two work-baskets made at Villa Franca, on the Rio Tapajoz, of the leaves in the young shoot of the *Tucamá* Palm.

36. A sort of basket (*Balaio*) made at Santarem, of the outer part of the stem of the *Uarumá-mirí*.

37. Two paddles made at Santarem, the one of *Itaüba préta*, the other of *Itaüba amarella*.

38. Bow made of *Páo d'Arco* by Mundrucú Indians, on the Rio Tapajoz. The string is made of the fibre of the leaf of a Bromeliaceous plant called *Curauá*, of which I have not yet seen the flowers: probably it is the same as the *Curauya* of Demerara (*Bromelia Karata*). Arrows made from the *Arvore de Frécha*. The one fitted up is such as the Tapuyas use at Santarem for killing fish.

39. *Páo de Guaraná* and *Lingua de Pirarucú*. Prepared chiefly by the Mauhé Indians (inhabiting the banks of the Rio Mauhé, which enters the Amazon between the Tapajoz and the Madeira), from the roasted and pounded seeds of the Guaraná (*Paullinia sorbilis*, Mart.). It is used throughout the province of Pará, and still more extensively in the mines of Cuyabá in Matto Grosso, in the preparation of a cooling beverage, and as a supposed preventive of all manner of diseases, rather than as a remedy against any. "Guaraná," the drink, is thus prepared: of the powder obtained by grating one of the rolls on the bony tongue of the fish called Pirarucú, about a table-spoonful is mixed with as much sugar in a goblet-glass nearly filled with water. Taken in this way, its properties seem to be slightly stimulant; I have drunk much of it, and a glass has much the same effect on me as a cup of tea or coffee would have. When used, as it sometimes is, as a remedy for

diarrhœa, it is taken without sugar. I tried it for some time when suffering under this malady, and I believe it quite powerless.

Guaraná is a staple article of trade between Santarem and Cuyabá. Merchants who come here with cargoes of gold and precious stones, return laden partly with Guaraná, which they buy at a milrei per lb., and sell in Cuyabá for six or eight milreis! The voyage however from Santarem to Cuyabá costs them five or six months, and the numerous Cachoeiras in the Tapajoz render it exceedingly perilous. In Cayabá, as I am informed by merchants of the place whom I have met here, Guaraná is retailed chiefly in the tabernas, and carefully weighed to a grain. To these places the thirsty miners resort in the intervals of their toil, and call for a "copo de Guaraná," just as they would for one of "limonada" or of "agoa doce."

As to the name, I have uniformly heard it and seen it written "*Páo* de Guaraná," or a stick of Guaraná, in the same sense as "páo de lacré," a stick of sealing-wax, and many other similar terms; never have I heard it "*Pão* de Guaraná," or Guaraná bread. When Captain Hislop arrived at Santarem, thirty-four years ago, it was made up into rolls of eighteen inches or more long, and therefore better deserved the name of "pao," than now, when the rolls weigh from half a pound to a pound, and rarely exceed in length the one I send. Martius says, "In panes fusci coloris ellipticos vel globosos formatum." I have never seen them "globose," but there can be no doubt of the correctness of his statement, and therefore "panes," as a general term, is applicable enough. Probably misinterpreting Martius's account, Lindley (Veg. Kingd. p. 384) speaks of "Guaraná *bread*, a *food* prepared by the Brazilian savages."

The essential principle of this substance is said to be identical with Theine and Caffeine, which I can well believe, for the immoderate use of Guaraná relaxes the stomach and causes sleeplessness; precisely the effect which results from the abuse of tea and coffee.

40. *Bactris interrupta*, MSS. n. sp. Stem 4–5 feet, weak, prickly. Remarkable for the fronds having a space in the middle destitute of pinnæ, and for the *floccose* rachis. Santarem, dense shady forest, April 1850.

41. Two entire fruits of the *Castanha* (*Bertholletia excelsa*), from Alemquer on the north shore of the Amazon.

42. Fibre of the *Curaná* (*Bromelia* sp.), and piece of rope made

from it. I will try to send you hereafter a longer piece of rope than this, which I have procured here after a long search.—This is the strongest sort of cordage made in Brazil, and is principally used for suspending hammocks.

43. Twine called "Maqueira," made of the fibre of the leaf of the Tucum palm (*Astrocaryum vulgare*, Mart.). Of this are made the hammocks which some travellers have called "grass hammocks." There are several of them on sale at Santarem, but I shall procure them cheaper and better at and above the Barra, where they are made.

44. *Müra-cuatiára*, called also *Pao rajado*, streaked wood. Rio Branco. The most esteemed of the cabinet-woods of the province of Pará. I send a piece polished, and also a rough slab; the latter might be worked up into something, and polished, if you choose.

45. *Müra-piníma*, or *Pao pintado*, painted or spotted wood. Rio Branco. A beautifully marked wood, but of exceeding hardness. Like most of the hard woods of this country, it is almost constantly perforated by insects, while some of the softer woods, such as the cedar, which have a strong smell and a bitter taste, are never touched by them.

46. *Müra-piranga*, or *Pao verinelho*, red wood. Shore of the Amazon, opposite Santarem. This takes a high polish, and is in great request for walking-sticks. It is sometimes of a deep blood-colour.

47. Bark of the *Pao d'Arco*, for cigars. (Prepared near the Barra do Rio Negro.) Two cigars and a roll of fifty strips of bark. This has only lately come into use. It is considered superior to Tanaré for cigars, and the inner white surface bears writing on exceedingly well. A French gentleman here is about to export a quantity of it to France.

48. Wood of a *Cassia*, Herb. no. 916. Santarem, by the Amazon. Twining to the top of the highest trees.

49. *Caraná* palm (*Mauritia aculeata*, Humb.). Near Santarem, in low marshy situations. Two portions of stems and six spadices. From the fruit of this palm an inferior wine is made. The stems, which rarely reach 30 feet in height, are put to the same uses as those of most other species; here they are much used in the construction of houses, strips cuts from their circumference being fastened crosswise to the upright poles, and the interval then filled with mud. The palmate leaves are so unwieldy that I do not send any; especially

as I have no doubt you have the plant growing, for it is abundant near Pará.

50. Four fruits of the *Mungúba* (*Bombax Munguba*), and cotton of another fruit. These fruits were of a clear brick-red colour, but this was lost in drying. The seeds are quite ripe and recent, but I presume you have the plant already. No use is made of the cotton here, except for the stuffing of cushions: it is considered much hotter than feathers.

51. *Sapindus*. Bunches of ripe fruit. Herb. 777. Tree, with the aspect of the Ash, abundant near Santarem. The fruits are occasionally used in lieu of soap, especially for shaving. A fruit of this given to me last year, which I sent you, I supposed to belong to *Euphorbiaceæ*, in consequence of all three of the ovaries being perfect, a very rare circumstance in this *Sapindus*.

52. Gum of the *Cajú* (*Anacardium occidentale*, L.), taken from an old tree on the Campos of Santarem. This is the finest specimen I have seen, but it is so fragile that I fear when it reaches you it will be in fragments. Besides this, it has been attacked by thousands of ants, and though a taste proves fatal to them, they still come on in fresh legions. This gum is used here as a varnish.

53. Fruit of the *Cumandú-açú;* a large tree with pinnated leaves on the banks of the Tapajoz. The grated kernels are taken in warm water as an emetic, yet they form a favourite food of parrots.

54. Resin and pod of the *Jutahí;* a large Leguminous tree in the forests of Santarem and Obidos. This resin is commonly used for glazing pottery. (There is another species of *Jutahí*, with larger pods and edible seeds, which affords the same gum, but I have not procured it; nor have I met with flowers of either species.)

55. Fruit of *Ingá-Sipó* (so called from the pods quite resembling some of the twining sipós). Small bushy tree, growing near rivulets in the forest of Santarem. Herb. 962. The pulp surrounding the seeds is edible, like that of the other *Ingás*. (I lately sent you seeds of this in earth.)

56. Vessel for containing water, called a *Jamarú*, being the scooped-out fruit of a gourd called by the same name. I have not seen this wild, and I know not if it be different from the common bottle-gourd of the East.

57. Fruit of a species of *Parkia*, a large tree in forests near Santarem, Herb. 1078. The long fruit-stalks hang perpendicularly down.

A viscid gum, with an unpleasant odour, exudes from the wounded trunk.

58. "*Birros,*" used on the Amazon in making cushion-lace. Seven of them are of the fruit of the *Tucumá* palm, the other five of the fruit of the *Mucajá;* four of the latter being polished by rubbing them with a stone. Breast-pins are sometimes made of the fruit of the *Mucajá,* but I have not yet been able to get one.

59. Fruit of the *Atta* (*Anona* sp.). Santarem, cultivated. This fruit is purple and glaucous when ripe; it has shrunk much by the drying up of the pulp, which is the edible part, and has the taste of a scarcely ripe Orleans-plum.

60. Fruit of a *Sterculiacea,* Herb. 837. Large tree, with the aspect of the Sycamore, frequent near Santarem. The follicles are of the purest scarlet when just burst open, but in drying they change to dull crimson.

(*To be continued.*)

On the BOTANY *of the* NORTH-WESTERN DISTRICT *of* WESTERN AUSTRALIA.

(*Continued from p.* 145.)

Proteaceæ produce many interesting species. On the first sand-plain the road passes over to the north of the Moore river, I found in abundance a fine new *Petrophila*, nearer *P. Shuttleworthii* than any species described, but the leaves are more divided, the divisions narrower, the heads of flowers larger, and the cones shorter.

A new *Petrophila,* near *P. biloba* in habit, but with larger leaves, which are thickly covered with long silvery hairs, grows on a low ironstone hill close to Mr. Davidson's station on the left bank of the Moore river; the flowers of this species were past when I found the plant, but the seed-vessels are very different from *P. biloba.* Another new *Petrophila,* with curiously pinnate leaves and small yellow flowers, grows abundantly on ironstone hills to the north of Dundaragan; this plant has but little resemblance, either in its flowers or foliage, to any described species. Another new species, belonging to Mr. Brown's second division of the genus, with filiform divided leaves, grows on

the rocks of the White Peak, and other hills of Moresby's range: the cones are longer and differently shaped from any of this section which I am acquainted with; the flowers have not been seen.

The ironstone hills to the north of Dundaragan, and most of the hills of Gardener's range, produce (but very sparingly) a new *Isopogon*, with linear leaves; it grows about a foot high, and bears large rose-coloured heads of flowers; this species resembles *I. latifolia* in its flowers, but the foliage is altogether different. On the same hills I found another new species of *Isopogon*, near *I. asper* of Mr. Brown, but it differs from it in the following characters:—*asper* has unbranched stems, the new species has numerous branches; *I. asper* has smooth anther-tubes, in the new species they are covered with white hairs; the scales also which surround the flowers are hairy and bent inwards, in *I. asper* the scales which surround the flowers have glabrous re-curved points.

An ironstone hill to the west of the river near the first spring on the hill, yields (sparingly) a very curious *Isopogon*, in habit and foliage so like *Adenanthos sericea* that when not in flower it may be easily passed over for that plant. I also met with a new trifid-leaved *Isopogon* with much broader leaves; it is a very rare plant, and seen only in one spot, on the great sand-plain to the north of the Diamond Spring.

Persoonia produces several new species, but I shall only notice one which is remarkable for its beauty; it is found abundantly on the first sand-hill which the road crosses to the north of Dundaragan. It grows in a low bush with glaucous spathulate leaves, about two inches long, and about half an inch broad near their points; the branches are numerous, and from the axils of every leaf, on their upper parts, upright racemes of golden-yellow flowers, from nine inches to a foot long, are produced; this is by far the finest species of the genus.

The ironstone hills between Dundaragan and the Smith river, produce in abundance two new *Grevilleæ*,—one a prostrate plant with pinnate leaves and branched racemes of rose-coloured flowers, in size and form resembling the flowers of *G. bipinnata;* this is a fine species. The other new species, which grows on the hills, is a slender, upright-growing plant, with hispid trilobate leaves, and long spikes of white flowers; it comes nearer *G. Manglesioides* than any described species. A new *Grevillea*, of the *Manglesia* section, grows near the first spring on the Hill river, on the same hill with the *Adenanthos*-like *Isopogon;*

its leaves on the barren branches are round, strongly nerved, with large teeth between the nerves; the leaves in the flowering branches are deeply trifid, with narrow pungent divisions; its flowers are of the same character as the other species of this section of the genus. Another fine species of the *Manglesia* section grows on the banks of brook-courses near Moresby's range; the leaves are very trifid, bearing some resemblance to *G. ornithopoda*, but the lobes are broader, and covered with a velvety down; the flowers I have not seen. A *Grevillea* with pinnate leaves, nearly answering the description of Mr. Brown's *Anadenia pulchella*, is frequently met with on the sand-plains in the Champion Bay district; and a new species, a bushy shrub with small linear leaves and red flowers, belonging to the *Lyssanthe* section of the genus, grows everywhere on the grassy hills of the Bowes country. I observed also a very curious *Grevillea* with multifid leaves, the divisions very long and narrow, and always branching off at right angles; this plant grows from two to three feet high, throwing up many unbranched stems from the same root; the branches are stout and upright, and the long divaricate leaves are so curiously interlaced, it is scarcely possible to separate any portions for specimens; I have not seen the flower. This plant has the seed-vessels and seed of *Grevillea*, but that is the only resemblance it has to any described species of this genus.

The sand-plains near the Hutt river produce a magnificent *Grevillea*, with fine pinnate leaves, fifteen inches long by nine wide; it grows in large bushes about four or five feet high; the flower-stalks, which have only simple leaves, rise above the plants to the height of six or eight feet, and terminate in large clusters of flowers a foot or more in diameter; the flowers are white, and have a strong honey-like scent.

The *Hakea conchifolia*, a rare species at the Swan, grows abundantly on the ironstone hills to the north of Dundaragan, and with it a plant resembling *H. attenuata*, but the flowers are white, and they are only produced at the termination of the strongest branches: the seed-vessels are echinate, as in *H. Lehmanniana*, and defended by formidable tricuspidate bracts. The same plains, near the Hill river, produce a fine *Hakea*, with leaves in size and form exactly resembling *Salisburia adiantifolia*; it is a much smaller plant than *H. Brownii*, with smaller and differently-shaped seed-vessels. A new red *Hakea*, with linear leaves about three inches long, grows on the White Peak and other

hills of Moresby's range. I found a fine red-flowered species, with leaves resembling *H. loranthifolia* in shape, but they are larger and the veins different; it grows abundantly on the east side of Mount Lesueur, near the top. The flat summit of Mount Lesueur produces sparingly another remarkable new *Hakea;* the leaves are glabrous, with very entire edges, broadly spathulate; the seed-vessels are about two inches long, by one and a half inch in breadth, and only about one and a half inch in thickness; the flowers I have not seen. The ironstone hills to the west of Dundaragan, and as far to the north as Gardener's range extends, produce a fine red-flowered *Lambertia*, nearly answering to Mr. Brown's description of *L. formosa*, but without the recurved margins to the leaves, described by Mr. Brown; this species bears its flowers in clusters of seven; when not in flower it is so like *L. multiflora*, I cannot tell one from the other by their leaves. The sand-plains to the west of Dundaragan, and those to the east and west of the Hill river, produce a curious *Banksia;* it grows in broad patches with stems creeping under ground, and leaves from a foot to a foot and a half in length, and about three-quarters of an inch in breadth, pinnatifid; the lobes are beautifully nerved; the stems grow about two feet high and terminate in flowers; the flowers are the size and form of *B. dryandroides*, but the follicles are larger than they are in any described species; most of the branches die after perfecting their seeds, and their place is supplied by fresh shoots from the stems under ground; only some of the stronger branches throw out shoots, which again terminate in flowers, when they also perish and others take their places; this species is one of importance to the natives, who congregate in numbers to feed upon the honey of its flowers, which they call "mangite,"—a name they give to the flowers of *B. grandis* and various other species.

In travelling to the north, the next new *Banksia* which makes its appearance near the road is a remarkable species with globe-shaped flowers of a metallic-green colour; the leaves are pinnate, and resemble in length and breadth those of *B. Prionotes;* the remains of the flowers fall off, leaving the follicles exposed; they are verrucose, the warts formed of a white wax-like substance. This species was first shown to me by Mr. Henry Gregory, but I afterwards met with it in many places in the Valley of the Lakes; it grows to be a small tree with a trunk a foot or eighteen inches in diameter. Another new *Banksia* grows to the north of the Tea-tree Swamp, which is about seventeen miles to the

south of the Irwin; it is a shrub growing five or six feet high, with a broad bushy top; the leaves are narrow, linear, about half a foot long and a quarter of an inch wide, glabrous above, with small teeth at the edges; the flowers resemble those of *B. Prionotes.* A fine *Banksia* with leaves like an evergreen oak, and pale sulphur-coloured flowers larger than the flowers of any described species except *grandis*, is seen sparingly on the sand-plain to the north of the Hutt river. Another new species, with leaves and flowers like *Banksia Prionotes*, grows with it; the leaves are broader, with larger and deeper divisions, and when full grown it is a bushy shrub not exceeding twelve or fifteen feet in height, whereas *B. Prionotes* is one of the tallest and quickest-growing species of the genus. Another new *Banksia* grows on this sand-plain; it is a straggling, decumbent species three or four feet high; the leaves are linear, five inches long, indented at the edges, nearly smooth when full grown; the flowers are yellow, four or five inches long, and they are followed by very rough cones; it grows in abundance on both sides of the road near the middle of the sand-plain. The flat summit of Mount Lesueur and other hills of Gardener's range, produce a remarkable *Banksia*, that has, when growing, a considerable resemblance to the Scotch Fir; the leaves are about three inches long, very narrow, the edges entire and rolled back, they end in three very minute teeth; the flowers bear a considerable resemblance to those of *B. verticillata*, and they are followed by similar seed-vessels.

A small *Dryandra*, with linear, pinnatifid leaves, bearing its flowers on the old stems near the ground, grows on the ironstone gravelly hills to the north and west of Dundaragan. Another very curious species of *Dryandra*, with creeping stems under ground, is common in dense patches from one to three feet in diameter; the stems grow about a foot high, they are mostly undivided; the flowers are borne close to the ground in a circle at the outside of the patches, they are large yellow blossoms surrounded by lanceolate bracts; the leaves of the plant are cuneate, ending in three obtuse teeth; the slender branches of this plant perform the same part as the leaves in *Aphragma nervosa*, and the flowers are borne close to the ground at the ends of the creeping stems much in the same way. A curious *Dryandra* nearly allied to *D. nivea*, but readily distinguished from the many varieties of that plant, or rather from the many species that are nearly allied to *D. nivea* in their flowers, although differing widely in habit, some with creeping

stems spreading for many yards under ground, and some growing wholly above ground; this plant is distinguished from all these by its styles, which are three times as long as in any described *Dryandra;* another creeping-rooted, or rather creeping-stemmed sort is distinguished by having strong woody dissepiments to the seeds, whereas *D. nivea* agrees with *D. Preissii* and *D. proteoides* in the structure of the seeds; it is a sort of *Diplophragma.* A new *Hemiclidium*, with leaves like *Dryandra armata*, but not so pungent as they are in that plant, grows in abundance on an ironstone hill with the new silvery-leaved *Petrophila.*

Close to Davidson's station, on the left bank of the Moore river, besides these Proteaceous plants which I have described, belonging to well-known genera, I met with two plants, which I suppose form the types of new genera of this Order. One has the habit of *Persoonia;* it grows in low spreading bushes from three to four feet high; the leaves are linear, about three inches long and a quarter of an inch wide, covered with stomates above and below; the flowers borne in the axils of the upper leaves. With the exception of the style and stigma, the other parts of the flower had fallen off when I found the plant. The seed-vessels are very different from *Persoonia*, being follicles an inch and a half long by three-quarters of an inch wide; they are deeply and irregularly grooved lengthwise, that is, the grooves are unequal in breadth and depth on the same seed-vessel; they each contain a single seed about an inch long, shaped like a seed of the Ash; each seed is enclosed by three membranous coverings: the outer and inner are smooth and brown, not unlike the wings of the seeds of *Hakea* and *Banksia* in substance; the middle membrane is of a light brown colour and very brittle; this plant grows on the great sand-plain to the north of the Diamond Spring. The other plant, which I suppose forms a new genus of this Order, grows fifteen feet high; the leaves are deeply pinnatifid, the pinnæ are narrow, stand out at right angles, and are rigid and very pungent; I saw only the old flower-stalks of this plant, with three perfect seed-vessels, they are the size of, and as round as, a musket-ball; the capsules are thin in substance and of equal thickness all round, the two seeds which fill up their inside being exactly hemispherical in shape, with thickened margins, without any vestige of wings. This plant, which creeps by its roots, grows in plenty over the great sand-plain between the Hutt and the Murchison, but flowers had only

been produced at the ends of the strongest branches of the most luxuriant plants.

EDIBLE FRUITS *of the* RIO NEGRO, *South America; by* RICHARD SPRUCE, ESQ.

1. *Piquiá-rána*, Ling. Ger.—*Caryocasylabrum*, Pers.—(Nat. Ord. *Rhizoboleæ.*) Coll. n. 1345.

HAB. Barra do Rio Negro, in the virgin forest, chiefly in moist situations near streams. The fruit is ripe in February.

Tree 60–100 feet high, and proportionately thick, with smooth bark, and hard heavy wood. Branches and leaves opposite, the latter ternate, smooth; leaflets oval, apiculate, obtuse, subentire, articulate with the short petiolules; a minute stipella to each lateral leaflet. Peduncles long, terminal, with 1–4 shortly pedicellate fruits matured on each. Fruit subglobose, as large as a small orange, thickly clad with brownish lepra; epicarp rather woody, brittle, soon falling away; mesocarp thick, pulpy, yellowish; endocarp bony, thickly beset with reddish acicular processes, penetrating mesocarp, and persisting when the latter decays, so as to simulate a thorny fruit. Seed exalbuminose; embryo pure white, consisting almost entirely of radicle, fleshy, firm. Stigma rayed, in a lateral dimple of the fruit, nearer base than apex. Calyx persistent, inferior, with five rounded lobes.

I first saw fruits of this, with the pulpy covering already fallen away, strewed about in the forest, and in this state reminding me of the prickly fruit of *Datura Stramonium*. I afterwards met with a tree bearing perfect fruit, and not too large to be cut down, from which my specimens were obtained. The kernel is very good eating, tasting like that of the Brazil-nut, but less hard.

2. *Umarí*, Ling. Ger.—*Couapia* sp.?—(Nat. Ord. *Chrysobalaneæ.*)

HAB. Barra; in sandy soil where the forest is not very dense. Fruit ripe in February.

Tree 45 feet by 12 inches or more, with something of the habit of the Sycamore. Leaves alternate, subdistichous, 9 inches by 4½–5 inches, ovate-oblong, with an abrupt slender apiculus, naked above, beneath clad with minute fawn-coloured shining pubescence, veins parallel, very prominent beneath, margins undulate. Stipules 0, or deciduous?

Drupe ovoid, as large as a small hen's egg; pellicle very thin, yellow (deep purple in var.); mesocarp not more than ¼ inch thick, firm, fleshy; endocarp bony.

This fruit requires to be kept a few days, in order to soften. The little of it that is eatable is very agreeable, and I cannot liken it to anything I have tasted in Europe.

I have not seen flowers of this species, but another very similar one, called *Umarí de Uruá**, is now (April) in flower, and is said to produce fruit of inferior quality. This latter has considerably smaller leaves, not abruptly apiculate, and still more lustrous beneath. There are distinct stipules present. The inflorescence seems exactly that of *Parinarium.*

The "*Umarí*" of Pernambuco, the seeds of which are a powerful vermifuge, is the *Geoffrœa spinosa*, L.

3. *Ymurá-ceêm*, Ling. Ger.—*Chrysophyllum* sp.?—(Nat. Ord. *Sapotaceæ.*)

HAB. Barra; sandy exposed campos, more rarely in the virgin forest. Fruit ripe in February.

Tree 20 feet by 4 inches, in dry open situations, and fruiting abundantly; in the moist forest growing to twice the size, but fruiting very sparingly; branched almost from base. Leaves opposite, exstipulate, coriaceous, oblong, 4½ by 2⅝ inches, subobtuse or retuse, rounded at the base, margins reflected, midrib stout, veins numerous, slender, parallel. Flowers on the short stalks, in clusters of about six on the naked branches. Calyx minute, 4-sepalous†. Fruit an oval, orange-coloured drupe, as large as a sloe; mesocarp thick, juicy, sweet. Seeds one or two; embryo antitropal, amygdaloid.

Every part of this tree is sweet to the taste; hence its Indian name "Ymurá-ceêm," or "sweet tree." The milk which exudes from the wounded trunk is white, thin, not copious, and scarcely viscid. The fruit is one of the most agreeable I have tasted in Brazil, and may be eaten in any quantity without cloying or producing any ill effects. It is in season for two or three weeks, and such is its abundance on a small campo above the Barra, that large parties go by water to the spot in order to gather it. The bark is accounted a sovereign remedy for diarrhœa; its taste is much like that of liquorice-root, but after

* *Couepia subcordata*, Spruce.

† In the specimens sent the calyx is pentamerous.

chewing it a slight burning sensation remains for a time in the fauces. I send a sufficient quantity of the bark to enable it to be analysed in England.

4. *Pepino do mato*, Portug.—*Ambelania ?* (Nat. Ord. *Apocyneæ.*)

HAB. Barra; dense shady forest. Fruit ripe in March.

Slender, branched tree, of 15–30 feet, with copious viscid sweet milk. Leaves opposite, exstipulate, stalked, coriaceous, smooth, ovali-oblong, subapiculate, obtuse, rounded at the base, beset with numerous minute glandular dots; veins rather numerous, parallel, combined into a longitudinal vein just within the margin. Fruit axillary, solitary, shortly pedunculate, superior, stipate, with small fleshy 5-lobed calyx, yellowish, $4\frac{1}{2}$ by $1\frac{3}{4}$ inches, oblong-obovate, obtuse, with five sub-prominent ribs, alternating with calyx-lobes, and terminating near the base in a small protuberance; between the ribs longitudinally rugose, and very sparingly muricate (so as to resemble a cucumber); two-celled; cells narrow, destitute of pulp, 00-seeded; sarcocarp thick, firm, very milky, smelling like a ripe apple when cut across, sweet-tasted. Seeds brown, oval, plano-convex; testa thin, hard; embryo in the axis, and nearly as long as the horny albumen; cotyledons minute, roundish; radicle long, fusiformi-terete.

This seems distinct from any described genus of *Apocyneæ;* it is perhaps nearest *Ambelania*, Aubl. The dotted leaves and intramarginal vein show an unexpected approach to Myrtles.—I cannot make out that it has any native Indian name; the Tapuyas of whom I have inquired all call it "*Pepino do mato*," or the "Forest Cucumber."

5. *Cupua-í*, Ling. Ger.—(Nat. Ord. ?)

HAB. Barra; near forest-streams. Fruit ripe in March.

Straight tree of 30 feet by 6 inches, with rather long weak branches. Ramuli and short thick petioles ferruginous. Leaves alternate, exstipulate, 14 inches long by 5 broad, oblong, passing rather suddenly into a slender apiculus, cordate and subunequal at base, penniveined, margins undulate, under surface grey with minute pubescence, scattered among which are brown stellate hairs, the latter more numerous on the veins. Fruit terminal, pedunculate, solitary (?), superior, 5 inches by 3, oblong, obtuse, mostly contracted in the middle, clad with very minute grey pubescence, interspersed with ferruginous lepra, 1-celled; pericarp woody, brittle. Seeds 00, immersed in fleshy subacid pulp, and attached to an axile placenta, ovate subcompressed, of the size of a

horse-bean; testa thinnish, soft, reticulated; albumen none; *cotyledons contortissimo-plicate;* radicle next hilum.

The pulp of this is very pleasant eating, being sweeter than that of the *Cupú-açú,* of which I sent flowering specimens to Mr. Bentham from Santarem under n. 954, *Genipa macrophylla.* The latter is an evident *Rubiacea,* with opposite leaves and interpetiolary stipules, and seems closely allied to the *Genipápa;* but its fruit is so exceedingly like that of the *Cupua-í* externally, that I am not surprised an Indian should class them together.

6. *Cocúra,* Ling. Ger., (distributed as *Pourouma retusa,* Spruce.)—(Nat. Ord. *Artocarpeæ.*) Coll. n. 1219.

Hab. Barra; dense forest, in moist situations. Fruit ripe in January.

Tree of 50 feet by 12–18 inches, supported on a cone of half-emersed compressed roots, obscurely ringed like a *Cecropia,* rings $\frac{3}{4}$–2 inches apart; central pith very slender; bark smooth, often tinged with light purple; ramuli pubescent. Leaves near apex of ramuli, on long floccose petioles; lamina 9 inches by 6 inches (on young trees much larger), ovate subobtuse, very obtuse at base; margins undulate; veins quite straight, leaving the midrib at an angle of 45°, and running almost to the very margin; across these extend numerous pellucid secondary veins nearly at a right-angle, and between the last are minute reticulations; under side of leaf pubescent, silvery, between the veins plicate (and so folded in vernation). Stipules linear-oblong, apiculate, bicostate, thickly pubescent without, silky within, falling with the evolution of the leaf. Cymes terminal, contracted, about five together. Pedicels short, very thick. Fruit as large as a small grape, drupaceous (a capsule included in a thickish succulent integument), ovate, pubescent, the skin and pulp purplish-black, one-celled, one-seeded. Pericarp thin, hard, brittle. Seed deep purple; albumen 0; cotyledons amygdaloid, contiguous by a narrow face; radicle opposite the hilum.

This does not agree well with any genus described in Endlicher; it is nevertheless perhaps *Pourouma,* Aubl. A large *Cecropiaceous* tree, with trifid leaves, which often grows along with it, is probably also a *Pourouma;* but of the latter I have not yet seen the flower or fruit.—The *Cocura* is a very handsome tree, especially when profusely laden with its clusters of black fruit, which resemble so many small bunches of grapes; nor does the taste belie the look, for I have not eaten any

fruit in Brazil which so much reminded me of the grape. The skin, from its harsh pubescence, is not pleasant to eat. The cotyledons stain the hands a deep purple. The tension of the *sapopemas*, or exposed portions of the roots, is remarkable: when struck they admit a sound like guitar-strings; when cut off at the base they fly up, and when cut on the side next the trunk they split along the middle. Though the stems are not hollow between the rings, as in the *Cecropiæ*, yet old trunks are often hollow in the middle. We cut down a tree of a foot in diameter, about three feet from the base, and when we approached the centre water began to ooze out; another stroke of the axe and we were saluted by a jet of water which reached to four yards from the base of the tree, and continued to play until many gallons must have run out. This water was very stale, both to smell and taste, and left a muddy deposit on the adjacent shrubs. It was certainly quite different from the juice of the tree, which is greyish-white and bitter to the taste; but how it had obtained access to such a reservoir I am not prepared to say, for the trunk was quite entire, and I examined the axils of all the branches, where not the slightest orifice was visible.

BOTANICAL INFORMATION.

Journal of a Voyage up the Amazon and Rio Negro; by RICHARD SPRUCE, ESQ.

(*Continued from* vol. iii. p. 278.)

[An accumulation of other interesting articles has rather interrupted the regular appearance of Mr. Spruce's Journal. In our last (the 4th) volume of the 'Journal' we gave the more recent information in extracts of letters received from Mr. Spruce (p. 278), dated Barra do Rio Negro, November 7, 1851; (p. 282), Falls of San Gabriel, high up the Rio Negro, December 28, 1851; and (p. 305), from the same place, April 15, 1852; since then we have only received a letter accompanying some extensive collections, dated San Gabriel, Rio Negro, August 19, 1852. He was then on the point of starting from San Gabriel to Rio Uaupés, with a crew of Indians, for the exploration of that river, which he assures us is "undoubtedly the main branch of the

Rio Negro, and whose source cannot be far from Santa Fé de Bogotá." The river Uaupés is laid down in the maps of the Society for Promoting Useful Knowledge, as directly under the Line, between the 67th and 68th degrees of west longitude, and as having its course nearly due west into the Rio Negro, a little above San Gabriel.

The line of steamers which we hear is immediately to be established upon the Amazon, as high as Santa Nanta (1800 geographical miles from the mouth !) cannot fail to contribute greatly to our knowledge of the physical state of this wonderful country, and to facilitate the transport of collections.—Ed.]

Barra do Rio Negro, April 18, 1851.

My dear Sir William,—By Senhor Henrique's cutter, which is about to sail for Pará, I am sending off such things as I have been able to get together for your Gardens and Museum, and also a large collection of dried plants for Mr. Bentham. At the same time I propose giving you some account of my proceedings, which, from my constant occupation, must necessarily be brief. My collections have gone on uninterruptedly since last date, save now and then from the heavy rains, which have rendered both the gathering and preserving of plants a difficult task. We reached the Barra on the 10th of December; the rains had set in some weeks previously, and from that date until the beginning of February, only a single day intervened entirely without rain. In February there were six fair days; in March (the most rainy of all the months) but one; and in April, up to the present date, we have had three days on which no rain fell; making a sum total of eleven fair days in between four and five months. Nor does the rain fall at stated hours of the day, as is customary at Pará and Santarem, save that it occurs much less frequently between sunset and sunrise than between sunrise and sunset. At Santarem we could so time our excursions as generally to escape rain, and during the whole rainy season we only twice got a thorough wetting; but here, for three weeks together, I have not once gone out without returning completely soaked. Perhaps in consequence of the continued rains, the average temperature is lower, and therefore more agreeable, than at Santarem. During the month of March, many days passed in which the thermometer never reached 80°, and the highest temperature I have registered for that month is only $84\frac{1}{4}$°. The maximum temperature for February is 88°. When the thermometer is low (that is, from 71° to 75°) in a morning

before sunrise, with a tolerably clear sky, I have found it a pretty sure indication of a fine day; and the contrary when the thermometer is high, however bright the sky may be.

My Rio Negro collections include examples of nearly every Natural Order of plants. *Leguminosæ* continue to constitute a large proportion of them, but *Cæsalpinieæ* and *Mimoseæ* are more numerous than *Papilionaceæ*, which was not the case in the localities previously visited. I have several large-flowered *Loranthi*, not found at Santarem, numerous *Rubiaceæ*, Myrtles, and Melastomas almost without end, and some curious intermediate forms between these two Orders. *Lecythideæ* are not scarce, but many of them very difficult of access, on account of their large size. The small-fruited species of *Lecythis* are called by the Indians *Macacarecuya*, or the "monkey's drinking-cup," their fruit quite resembling a cup, when the lid has fallen off. *Myrsineæ* are far more abundant here than I have seen them on the Amazon: they are all shrubs or small trees, reminding me of the currant-berry by the aspect, and often by the odour of their pendulous racemes of small flowers, which are however occasionally more gaily coloured. The Barra has afforded me five *Myristicæ* previously unnoticed, and it is worthy of remark that in every tree of this genus I have met with, the branches are arranged *in whorls of five;* but the secondary ramification does not follow the same law. Soon after our arrival the banks of the streams were quite gay with a small Tiliaceous tree, bearing large, white, star-like flowers; it agrees in most respects so well with the *Mollia speciosa* of Mart. and Zucc. (gathered also at the Barra) that I have little doubt of its being the same, although it recedes somewhat from the generic character given in Endlicher; the stamens, instead of being collected "in phalanges quinque," are arranged in ten parcels, five outer and five inner, the former having *purple anthers and green pollen*, and the latter *yellow anthers and yellow pollen.*

Grasses are less numerous here than at Santarem, but they show more novelty of form. There are three *Selaginellæ* in the woods, but Ferns are scarce, occurring only towards the head-waters of the igaripés; they include however a few species of *Trichomanes* new to me. Orchids are still not very numerous, but there are a few, both terrestrial and epiphytal, which I have not previously met with. The Palms I am much interested in; they are far more numerous than at Santarem, and, I believe, include several undescribed species. I expect I have, amongst new species, one *Maximiliana*, one *Euterpe*, one *Iriartea*,

two *Bactrides*, and two or three species of *Geonoma*. I send you specimens of all these, but I should like to have time to observe them more fully before sending the descriptions. Perhaps the noblest Palm in the forests of the Barra is the *Pataná*, of which the trunk sometimes reaches eighty feet in height, and the fronds are of immense size. An entire spadix, laden with fruit, is a heavy load for a man. The fruits are very oily, but the only use made of them here is in the preparation of a wine similar to that of the Assaí. Trunks of a few years' growth are thickly beset with slender, rigid spines, about two feet in length, pointing upwards; these are the nerves of the sheathing base of the petioles, from which the parenchyma has decayed; they are called by the natives "Barba de Pataná." When the trunk reaches fifteen or twenty feet in height, the "beard" begins to decay at the base, and the upper part, being thus deprived of its support, falls down in a mass. From the circumstance of this envelope, I at first thought the species might be *Œnocarpus circumtextus*, Mart., but the pinnæ being merely acute, and not "abrupte longe acuminatæ," forbids such a conclusion. The *Inajá* (*Maximiliana regia*, Mart.) has the trunk similarly beset with the bases of the petioles, until it reaches a certain height, and an *Inajá* of forty feet high looks a quite different plant from one of twenty feet. Of the "Barba de Pataná" the Indians make the arrows for their Gravatánas, or blowing-canes. The Gravatána itself is made of the trunk of a small Palm, an *Iriartea*, which I have met with deep in the forest at the back of the Barra. It is called *Paxiuba-í*, or the little *Paxiúba*, and is from ten to eighteen feet high, the thickness being little more than an inch. The upper part of the stem and the sheaths of the petioles are clad with dense greyish pubescence, intermixed with blackish setæ, which stick into the hands when touched, producing a sensation like the hairs of Cowage. The pinnæ resemble those of *I. exorrhiza* in form and cutting, but they are pubescent, sparsely above, densely beneath. The fruit is rather smaller than a nut-kernel, vermilion, cylindraceo-obovate and subcurvate; mesocarp very thin; endocarp a thin green mucilaginous membrane, traversed longitudinally by about ten white anastomosing fibres; albumen whitish corneous. The spathes are three, plano-convex, closely investing the peduncle; the lowest naked, the two upper pubescent.

I have called this Palm *Iriartea pruriens*, but I should like to see *I. setigera*, Mart., before I decide upon its being new. The latter is described as growing fifty feet high, and nothing is said about the pubes-

cence of the stem, or of the upper surface of the fronds; the fruit too is elliptical, and the spathes four or five in number. These are striking differences, but I cannot yet pronounce on their value.

A Palm much cultivated in the Barra and the adjacent sitios, and said to grow wild up the Rio Negro, is the *Popúnha*, which I suppose to be the same as the Pirijaô (*Guilielmia speciosa*, Mart.) mentioned by Humboldt as growing on the upper Orinoco. The fruit of this is perhaps more valuable as an edible than any other Palm-fruit; the sarcocarp contains a large quantity of starch, and it is sometimes developed to such a degree that the nucleus is quite obliterated. Eaten with salt, the boiled or roasted fruit much resembles a potato, but it is also very pleasant eating with molasses. A spadix of *Popúnha*, laden with ripe fruit, is one of the most beautiful sights the vegetable world can show: the fruits are of the clearest scarlet in the upper half, passing below into yellow, and at the very base to green.

On a separate sheet I have written some account of a few of the edible fruits found wild in the forests adjacent to the Barra. There are several others, which I have not yet obtained. Numerous Myrtaceous and Melastomaceous fruits are eaten, but few of them possess any great excellence; perhaps the best are the *Guayabas*, which belong to various species of *Psidium*. A Melastomaceous tree sent from Santarem, with fruit rather resembling a *Guayaba* externally, but twelve-celled, is very abundant here. The fruit is called *Tapiri-guayaba*, or the Tapir's guayaba, but it is only insipid eating. The various species of *Inga* have the seeds enveloped in a sweet cottony pulp, which is very agreeable eating; the *Ingá-sipó* (of which I have already sent you the fruit) is the most esteemed.

The "Cow-tree" is represented on the Rio Negro by two *Apocyneæ*, the *Cuma-í* and the *Cuma-açú*, both species of *Collophora*, but only one of them known to Martius. The former is frequent near the Barra, and early in March was a great ornament to the forest, especially near the river, being profusely clad with corymbose cymes of red flowers. It grows thirty or thirty-five feet high, with a diameter of about twelve inches, and the branches and leaves grow in threes. The milk flows out abundantly on a slight incision being made in the bark; it is of the consistency of new milk, of the purest white, and very sweet to the taste. The Indian mode is to apply the mouth directly to the gash, and thus receive the milk as it oozes out: in this way I have many times partaken of it, without experiencing any ill effects. Its

extreme viscidity has suggested its employment in diarrhœa, and there is no doubt that if taken in sufficient quantity it would actually glue up the viscera. The *Cuma-açu* is a much larger tree, but of similar habit, and the milk is of a thicker consistence: it is said to flower towards the end of the year. The fruits of these two trees are said to be the most agreeable of any on the Rio Negro, and from their resemblance to the fruit of *Pyrus Sorbus*, have been called "Sorvas" by the Portuguese settlers.

It is perhaps among twining plants, or *Sipós*, that the greatest botanical novelties remain to be found; they are in many cases so difficult to collect, that I have no doubt a great many have been passed over by travellers. I am now paying particular attention to them, and my Barra collection includes twiners of the Orders *Leguminosæ*, *Connaraceæ*, *Polygaleæ*, *Malpighiaceæ*, *Sapindaceæ*, *Convolvulaceæ*, *Hippocrateaceæ*, *Bignoniaceæ*, *Apocyneæ*, *Asclepiadeæ*, *Menispermeæ*, and some others.

(*To be continued.*)

NOTICES OF BOOKS.

HARVEY, DR. WILLIAM HENRY: NEREIS BOREALI-AMERICANA; *or, Contributions towards a History of the Marine Algæ of the Atlantic and Pacific Coasts of North America.* Part II. RHODOSPERMEÆ. Washington, 1853. Large 4to, many coloured plates.

We congratulate our botanical friends on the appearances of this the Second Part (almost a volume in itself) of the Marine Algæ of North America: and it is a matter of congratulation too that this is not the concluding portion of this most important work; but that another portion or section, including the *Chlorospermeæ*, or Green Algæ, will be put in hand on the return of the author from a voyage of great interest which he is about to undertake in search of the Algæ of the southern hemisphere. We trust to give a further notice of the present part of the Nereis, from the pen of a friend more competent to do justice to the work and to its author than the Editor of this Journal can be supposed to be. At present we shall only say that the descriptions are fully equal to, and the figures even superior to, those of the First Part.

Florula Hongkongensis: *an Enumeration of the Plants collected in the Island of Hongkong, by* Major J. G. Champion, 95*th Reg.; the determinations revised and the new species described by* George Bentham, Esq.

(*Continued from p.* 137.)

Plantagineæ.

Plantago *major*, Linn., var. *Asiatica*, Dcne. in DC. Prod. vol. xiii. p. 694.

Waste places, Hong-Kong.

Plumbagineæ.

Statice *Sinensis*, Girard.—Boiss. in DC. Prod. vol. xii. p. 642.—*S. Fortunei*, Lindl. Bot. Reg. 1845, t. 63.

Æstuaries and salt-water pools towards Saywan.

Amarantaceæ.

The only representatives of this Order found in the Island are three widely diffused tropical weeds; *Pelosia argentea*, Linn., *Achyranthes aspera*, Linn., and *Amarantus oleraceus*, Linn. Specimens of the two former were gathered by Major Champion, and of the latter by Mr. Hinds.

Polygoneæ.

1. Rumex *crispus*, Linn.
   Roadsides, Saywan.
2. Polygonum *orientale*, Linn., *β. pilosum*, Meisn. in Wall. Pl. As. Rar. vol. iii. p. 54.
   Hong-Kong.

The plant gathered in Hong-Kong which I had referred with doubt to this species as a variety *discolor*, proves to be very distinct. The seeds which I formerly examined were all too young to ascertain the structure of the embryo. I have now however succeeded in finding one nearly ripe, in which the cotyledons are certainly parallel to the flat sides of the seed, and the whole embryo being slightly curved along one edge of the albumen, the radicle must be considered as accumbent, and the plant referred to the section *Persicaria*, coming very

near to *Polygonum lanigerum*, and to *P. glutinosum*. I am not sufficiently acquainted with the limits of variation of these species to determine whether it be a mere variety of one of them, or a distinct species. The ochreæ are nearly those of *P. Persicaria*; the clothing of the underside of the leaves that of some forms of *P. lanigerum*; the upper surface is green and smooth, or sprinkled with short hairs. The achenia are compressed with blunt sides. The branches of the style divaricate, with capitate stigmata, as in the section *Amblygonon*.

3. Polygonum *Chinense*, Linn.

In ditches.

4. Polygonum *herniarioides*, Delile. — Meisn. in Wall. Pl. As. Rar. vol. iii. p. 62.—*P. Meyeni*, C. Koch, Linnæa, vol. xxii. p. 205.

Rice-fields. The firm, blunt, thickish, strongly one-nerved leaves and very small flowers induce me to refer this plant to this common East Indian species (or variety of *P. aviculare*), although the flowers I examined were certainly hexandrous. There is very little doubt it is the plant called *P. Meyeni* by C. Koch in the above-quoted paper, apparently drawn up without reference to Meisner's valuable labours on this genus.

SANTALACEÆ.

635 Henslowia *frutescens*, Benth.; fruticosa, terrestris, foliis alternis obovatis ellipticisve obtusis 3–5-nerviis, pedunculis axillaribus 1–3-nis, masculis umbelliferis, fœmineis unifloris.—*Viscum heteranthum*, Wall., et *V. platyphyllum*, Spreng. in DC. Prod. vol. iv. p. 279?—*Frutex* erectus v. decumbens, glaber, abortu dioicus. *Folia* coriacea, $1\frac{1}{2}$–2 poll. longa, 9–12 lin. lata, basi in petiolum angustata; nervi supra vix conspicui, subtus plus minus prominuli, nunc 3 simplices, nunc 3 lateralibus bifurcatis, nunc 5 a basi distincti. *Flores* 5-meri v. rarius 6-meri; *masculorum* pedunculus 2 lin. v. rarius 3 lin. longus, floribus 3–5 parvis; pedicelli $\frac{1}{2}$–1 lin. longi, singuli bractea squamæformi subtensi. *Alabastra* globosa. *Discus* et *stamina* ut in icone Blumeana *H. variantis* depicta. *Stylus* abortivus, obtusus. *Flores fœminei* clavati, bracteis 4–5 minutis ad apicem pedunculi brevissimi verticillatis quasi calyculati. *Stylus* brevis, columnaris, apice dilatato 5-lobus. *Ovarii* loculus per anthesin minutissimus, prope apicem tubi carnosi floris situs. *Ovula* 2 (v. 3?) e placenta brevi crassa lateraliter cohærente pendula. *Drupa* ovoidea, 6 lin. longa, coccinea,

endocarpio crasso osseo lignoso 5-sulco rugoso celluloso. *Semen* junius acute 5-angulatus.

Common on the hills, with an erect habit, or often trailing when in under-wood. Flowers yellowish-green, in January. Fruit in May, scarlet when ripe. Although not parasitical, there is no doubt that it belongs to Blume's *Henslowia*, and is probably a widely-spread species in North India, identical with *Viscum heteranthum* of Wallich (pointed out to me by Dr. Hooker as a species of *Henslowia*), and probably also with *V. platyphyllum* of Sprengel, a name altered from *V. latifolium* of Hamilton. In the dried state indeed it can scarcely be distinguished from some of the *Henslowiæ* of the Indian Archipelago, but they are all said by Blume to be truly parasitical in the way of *Viscum*, and Major Champion found our plant always terrestrial.

THYMELEÆ.

1. Aquilaria *Malaccensis*, Lam.—DC. Prod. vol. ii. p. 59.

Happy Valley. These specimens agree precisely with Lamarck's figure, nor can I perceive any difference between them and the *A. Agallocha*, Roxb., except that the leaves are usually, but not always, broader, and the flowers rather larger.

2. Wikstrœmia *Indica*, C. A. Mey.—*Daphne Indica*, Linn.—Hook. et Arn. Bot. Beech. t. 15.

Common on the hills. Flowers greenish-yellow. Berries scarlet. Fortune's n. 147 appears to be a broader and shorter leaved variety of the same plant, being most probably the *W. viridiflora*, Meisn.

3. Wikstrœmia *nutans*, Champ., sp. n.; foliis oppositis ellipticis utrinque acuminatis glabris, racemis brevibus pedunculatis nutantibus, perigonii limbo quadrifido obtuso, ovario glabro, squamis hypogynis per paria connatis.—Habitu *W. Indicæ* approximatur. *Folia* acutiora, tenuiora, pleraque pollicaria, semipollicem lata, interdum in ramulos vegetiores fere duplo majora, subtus pallida. *Racemi* ebracteati, 4–8-flori, pedunculo 3–9 lin. longo, rachi plus minus elongata, rarius tamen semipollicem adæquante. *Pedicelli* brevissimi, v. rarius lineam longi. *Perigonii* tubus 4–4½ lin. longus, lobi oblongi, 1½ lin., intus extusque glabri. *Squamæ* 4, per paria usque ad medium v. altius connatæ, angustæ, ovario multo breviores. *Stylus* brevis, tenuis. *Stigma* globosum, fere diametrum ovarii æquans.

Hills about the Happy Valley, in autumn. This must be very near

the *W. Shuttleworthi*, Meisn., a New Holland plant, but the flowers (of a yellowish-green) are much longer, in nodding spikes, which, although very short, are not condensed into close heads like those of *W. Indica*.

4. Daphne *Fortunei*, Lindl. in Hort. Soc. Journ. vol. i. p. 147.

Very young specimens sent with those of *Wikstrœmia Indica*. The late Professor Zuccarini considered this species not to be distinct from his *Daphne Genkwa* from Japan.

Elæagneæ.

Elæagnus *Loureiri*, Champ., sp. n.; foliis ovatis supra viridibus subtus ramulis floribusque dense ferrugineo-lepidotis, perigonio amplo tubuloso campanulato supra ovarium leviter constricto apice cum limbo erecto continuo.—*E. latifolia*, Lour. Fl. Cochinch. p. 89? non Linn.

Mount Parker and Mount Gough, also on the mainland. This species, the most distinct of the whole genus in the shape of its flowers, has the leaves much like those of the *E. latifolia*, Linn., in shape, but the scales which cover their under surface, as well as the petioles, branches, and inflorescence, are much larger and of a rusty brown, and are particularly dense on the flowers themselves. The inflorescence is that of most species, a short raceme often reduced to a fascicle of three or four flowers, or to a single flower; but the pedicels are long and the flowers large. The portion of the tube which encircles the ovary is about 1½ lines long, lined by a disc which scarcely projects above the constriction. The remainder of the flower is full 8 lines long, nearly 5 lines in diameter at the base of the divisions, where there is none of the contraction observable in almost all *Elæagni*. The divisions, four in number, are nearly 3 lines long, apparently erect (not spreading as in other species), and have a few hairs in the inside at their base, the perigon is otherwise quite smooth inside as well as the style. The filaments are nearly half the length of the lobes of the perigon.

Major Champion considers the above plant to be the *E. latifolia* of Loureiro, a Canton species, with whose description it certainly does not disagree. He mentions also having seen a drawing of it in the Horticultural Society's collection, under the name of *Octarilla*, Lour. If however the latter plant be really an *Elæagnus*, it may be referred with much greater probability to another South China species, which may be thus characterized:—*E. gonyanthes*, Benth., sp. n.; foliis elliptico-oblon-

gis obovatisve obtusis supra viridibus subtus ramulis floribusque ferrugineo-lepidotis, pedicellis elongatis, perigonii tubo supra ovarium constricto dein pyramidato-tetragono, lobis amplis patentibus. — From China, *Parkes*, communicated by Dr. Lindley.—Leaves longer than in *E. latifolia*, and more blunt. Flowers much larger, especially the lobes, and borne on much longer pedicels; the tube is a little more than one line below the constriction, then about 2 lines in the square part, and the lobes, which spread horizontally, are nearly 3 lines long.

Mr. Fortune has sent home specimens of two other species, the one (A. 77) from North China, appears to be identical with the Himalayan *E. parvifolia*; the other is new, with the leaves nearly of *E. latifolia*, but remarkable for the slender tube of the perigon, not contracted above the ovary, and but little enlarged from thence to the base of the divisions. It may be thus characterized:—*E. tenuiflora*, Benth.; foliis ovatis ellipticisve acuminatis supra viridibus subtus ramulis floribusque ferrugineo-lepidotis, perigonii hypocraterimorphi tubo tenui supra ovarium vix constricto nec sub lobis patentibus contracto.—From China, *Fortune*, n. 114.—Racemes short, with longish pedicels. Flowers nodding. Tube of the perigon 1½ line to the top of the ovary, thence to the top three lines, lobes about two lines. Ferruginous scales on the flowers nearly concealing a substratum of much smaller silvery white scales.

LAURINEÆ.

1. Cinnamomum *dulce*, N. ab E. Syst. Laurin. p. 62.

Near the Buddhist Temple; woods at East Point.

From Mr. Hinds I had a specimen also of *C. Zeylanicum*, Breyn., probably cultivated.

2. Phœbe *latifolia*, Champ., sp. n.; glaberrima, foliis ovatis obovatisve abrupte acuminatis, corymbis glabris paucifloris, perigonii laciniis intus staminibusque hirsutis.—Affinis *P. lanceolatæ*, N. ab E., sed foliorum forma primo intuitu distincta. *Arbor* est, partibus interioribus floris exceptis, glaberrima. *Folia* sparsa, 2–3 poll. longa, 1½–2 poll. lata, apice sæpius rotundata, acumine longiusculo obtuso terminata, rarius in acumen breve desinentia, basi rotundata v. subcuneata, penninervia; petiolo semipollicari. *Corymbi* axillares, pauciflori, folio breviores, pedunculo (ineunte anthesi) ½–1-pollicari. *Bracteolæ* in-

conspicuæ. *Flores* extus glabri, magnitudine et forma iis *P. lanceolatæ* similis; conveniunt quoque structura et genitalibus.

In the Happy Valley woods.

3. Machilus *Thunbergii*, Sieb. et Zucc.—Blume, Mus. Bot. p. 331?

Hong-Kong. The specimen is in fruit only.

4. Machilus *velutinus*, Champ. sp. n.; perulis velutinis, foliis elliptico-oblongis acuminatis basi angustatis coriaceis nitidis subtus ramulis petiolis inflorescentiaque ferrugineo-velutinis, corymbis terminalibus sessilibus confertifloris.—*Folia* breviter petiolata, 3–5 poll. longa, 1–1½ poll. lata, margine revoluta, supra glaberrima, subtus pilis ferrugineis densis velutino-sericea. *Corymbi* fere capitati, dense multiflori, foliis breviores, sericeo-velutini. *Bracteæ* squamæformes, fere 3 lin. longæ, ovatæ, concavæ, extus sericeæ, primum imbricatæ sed jam ante anthesin deciduæ. *Pedicelli* 1 lin. longi. *Perigonium* fere 3 lin. longum, molliter villosum, sexpartitum, laciniis interioribus paullo minoribus. *Stamina* et *pistillum* omnino cum charactere generico a Neesio, vel forte melius a Blumeo (Mus. Bot. vol. i. p. 329) exposito conveniunt. *Bacca* perigonio persistenti immutato laxo imposita, ipsum paullo excedens, depresso-globosa, purpurea.

At the Buddhist temple, on Victoria Peak, Mount Parker, etc., rather common in these localities. Flowers in December, of a straw-colour, pinkish at the base, with pink pedicels. Berry purple.

5. Machilus? sp.

A single specimen, with one fruit only, and insufficient to determine the genus with certainty.

6. Alseodaphne *Chinensis*, Champ. sp. n.; foliis oblongis v. oblongo-lanceolatis basi longe angustatis glabris, paniculis terminalibus folia vix superantibus divaricato-ramosis, perigonii laciniis oblongis, exterioribus minoribus.—*Arbor*. *Folia* majora fere *Lauri nobilis*, 3–4 poll. longa, 1–1¼ poll. lata, breviter acuminata, basi acuta, petiolo semipollicari, supra nitida, subtus pallidiora, costato-penninervia et reticulato-venulosa; superiora sæpe multo minora et interdum in obovatam formam abeuntia. *Paniculæ* fere *A. semecarpifoliæ*, sed minores et paucifloræ. *Pedicelli* 2 lin. longi. *Perigonium* 2 lin. longum, laciniis oblongis chartaceis cum staminibus cito deciduis glabris, exterioribus quarta parte brevioribus et paullo angustioribus. *Stamina* et staminodia generis. *Stylus* apice discoideus, cum flore deciduus.

Bacca pedunculo nudo haud incrassato insidens, globosa, in specimine immatura jam 4 lin. diametro.

Near the Waterfall in the Happy Valley.

7. Tetranthera *Roxburghii*, N. ab E. Syst. Laurin. p. 515, var. foliis obovatis, umbellulis umbellatis villosis.

In the Happy Valley.

8. Tetranthera *floribunda*, Champ. sp. n.; umbellulis præcocibus infra
6730 ramulorum apices fasciculatis, foliis annuis oblongis lanceolatis basi acutis glaberrimis.—*Arbor* pulcherrima. *Ramuli* et folia nascentia tomento minutissimo canescentia, mox glabrata. *Folia* post flores nascentia, 2–2½ poll. longa, 6–10 lin. lata, juniora membranacea, demum tenuiter coriacea, utrinque glabra, subtus sæpe glaucescentia. *Ramuli* floridi, omnino aphylli v. rarius folia pauca vetusta gerentes, mox innovationibus connecti, dense floribundi. *Pedunculi* 3–4 lin. longi, per 3–4 fasciculati v. brevissime racemosi, glabri v. basi minute canescentes. *Involucri* foliola orbiculata, concava, extus glabra, intus sericeo-pubescentia. *Flores* in umbellula sæpius 6, subsessiles. *Perigonii* foliola 6, subæqualia, obovalia v. subquadrata, crenato-crispula. *Stamina* 9, introrsa, glabra, 3 interiora biglandulosa. *Antheræ* 4-locellatæ. *Ovarii* rudimentum ovatum, acuminatum, glabrum. *Flores fœmineos* fertilesve non vidi.

Common in the Happy Valley woods. A most beautiful tree. When, as at intervals from December to February, the young leaves are just coming out, and the naked branches are for several feet loaded with blossoms of a pure white, the appearance is superb. The specimens gathered are all male, the female flower has therefore not yet been examined. Fortune's specimens (n. 178) are in the same state.

9. Actinodaphne *Chinensis*, var. *oblongifolia*, N. ab E. Syst. Laurin. p. 600.

Very common on hills and in ravines.

10. Daphnidium *bifarium*, N. ab E. l. c. p. 616.

Gathered by Col. Eyre in a ravine of Victoria Peak, who saw but one tree. Major Champion thinks he has seen it also as a shrub. The specimen contains female flowers only. It agrees in every respect with Himalayan specimens, except that I find but six or seven flowers in a head, and the leaves are shorter without being narrower.

1. Litsæa *Ceylanica*, N. ab E. l. c. p. 626, var. *Chinensis*, foliis minoribus subtus glauco-cæsiis apice distinctius acuminatis.

Victoria Peak and woods at East Point, near the Buddhist temple, but rare. It is a shrub coming perhaps as near to *L. consimilis* of Nees as to the normal Cingalese form of the species, but all are probably mere varieties of one widely-spread species.

12. Cassytha *filiformis*, Linn.

As common in the Island as in East India and other countries.

(*To be continued.*)

Versuch eines Commentars über die Pflanzen in den Werken von Marcgrav und Piso, etc. Attempt at a Commentary on the Plants in the works of Marcgrav and Piso on Brazil; with some further details concerning the Flora of that Kingdom. By Dr. C. Fr. Ph. von Martius. 1. *Cryptogames.* Munich, 1853, 4to. (From Memoirs of the Royal Bavarian Academy of Sciences. Cl. II. vol. vii. sect. 1.) Translated from the German by Dr. Wallich, V.P. Royal and Linn. Soc.

(*Continued from p.* 169.)

It is certainly evident from this edition and from the first, that Piso, as physician, had enjoyed more opportunity to deal with plants, than Marcgrav. The traditional information on simplicia, such as the physicians of those days possessed, no doubt enabled Piso to describe the appearance and particular parts of a plant with much readiness; and the useful, especially the medicinal plants, accordingly attracted his particular notice. Marcgrav, on the other hand, took great interest also in other plants, which appeared to him to differ from European forms; speaking of them with the candour of a self-taught man, little acquainted with the technical terms of the school of those days, and evidently somewhat embarrassed in his efforts: a circumstance which certainly places much difficulty in the way of clearly making out what particular subject he had before him. Considering therefore the state of the science when our authors flourished, we must not reproach them with the want of systematic and clear descriptions. Even in the writings of the immediately preceding period, of P. A. Matthiolus (born 1500, d. 1577), Conrad Gesner (born 1516, d. 1565), Joachim Camerarius (born 1534, d. 1598), Clusius (born 1526, d. 1609), Lobel (born 1538, d. 1616), and others, we meet with a want of a terminology

founded on firm principles, whose first dawn appeared with L. Fuchs and Cæsalpin; and thus we have often as much difficulty in knowing and determining with certainty what plants those authors meant to describe. But what serves to enhance so highly the value of Marcgrav's labours, is his figures, and referring to these, as well as the unquestionable right of priority, demonstrated by the first edition of the work, systematists have habitually given Marcgrav the first place among authors on Brazilian plants. This has been done accordingly by Casp. Bauhin, Ray, Johnston, Plukenet, Mentzel, Adanson, and Linné, who have all treated and quoted the works of those two men, as quite distinct from each other. In more recent times this has been less attended to, on account of Piso's work of the year 1658 being much more in the hands of botanists than the older edition of 1648, which is said to have been in part destroyed by fire.

The original drawings which Moritz of Nassau had got made in Brazil, met with a better fate than fell to the lot of the edition in question, or the astronomical manuscript of Marcgrav. The history of these literary treasures forms so important an illustration in my present attempt, that I deem it necessary to repeat it from M. Lichtenstein's memoir*. Already in the year 1652 had the Count entered the service of the great Elector of Brandenburgh, who raised him in 1654 to the dignity of a prince and invested him with high offices. It is probable that the close friendship which continued between these princes until the death of Moritz (in 1679, in his seventy-sixth year), induced him to offer his original paintings as a present to a monarch who was attached to science. The collection consisted in figures of natural products, executed on paper in oil by the before-mentioned master, comprised in two volumes, and containing likewise similar, though smaller, representations in water-colour. Considered in the light only of their high degree of perfection as works of art, these oil paintings deserved already great attention; and the Elector ordered them accordingly to be carefully put in order and preserved in his library. This business was confided to the experienced hands of his physician in ordinary Dr. Christ. Mentzel, celebrated moreover as a scholar, and in high favour with his master. He caused the oil paintings, which were of unequal size (425 in number) to be bound together in four volumes of large size, the paintings being arranged according to a judicious plan (by

* Transactions of the Berlin Academy for 1814 and 1815, p. 204.

which the plants and fruits made up the fourth volume); and accompanied with a repetition of the Brazilian name, and a reference to Marcgrav and Piso for further information*; the smaller collection in water-colours being always quoted, whenever the same subject occurs in it. M. Lichtenstein considers it, from various reasons, as highly probable, that this last-mentioned collection, which the Count of Nassau had in common use, and which contained his own notes, was the produce of Marcgrav's pencil. It is called "Liber principis" in the Royal Library. All these most precious materials are at present in the Royal Library at Berlin, and entered in the catalogue of manuscripts under the head of libri picturati in folio, A. num. 35. There is besides a copy of Marcgrav's work, with the woodcuts coloured from those originals, which M. Lichtenstein conjectures to have been likewise the Prince's own copy. The directors of the Berlin Royal Library have, with literary liberality, granted me permission to have oil copies taken of the figures of plants in the Theatr. rer. nat. Brasiliæ, on paper as in the originals, and guaranteed as regards their fidelity, by the fact, that Messrs. Ehrenberg and von Schlechtendal superintended their execution. In this manner have I been placed in possession of the richest possible literary apparatus, for illustrating those early labours in the flora of Brazil.

One thing, however, is still wanting to the commentator, which would have been extremely desirable in his inquiries, namely a complete view of the vegetations of the regions where Piso and Marcgrav pursued their labours; for it happens to be precisely the territory from the southward of Ceará to the great Rio de S. Francisco, which has hitherto been least visited by botanists; and the materials gathered there have only in a slight proportion become a common stock among botanists. Though three native Pernambucans have occupied themselves, in the first decades of the present century, with the flora of their country, the results contribute only little to the solution of our problem, and it will therefore suffice for literary and historical purposes simply to notice them here†. Manoel Arruda da Camara has published three works treating of the plants of those regions: Memoria sobre a cultura

* The title which Mentzel gave these volumes is: *Theatrum rerum naturalium Brasiliæ.*

† Compare my view of the authors on the Flora of Brazil, in supplement to Allgemeine Bot. Zeitung, 1837, vol. ii. p. 13.

dos Algodoeiros e sobre o methodo de colher e ensacar, Lisboa, 1799, 8vo; Discurso sobre a utilidade da Instituiçam de Jardins nos principaes provincias do Brazil, Rio de Janeiro, 1810, 8vo; and Dissertaçam sobre as plantas do Brazil, qué podem dar linhos proprios para muytos usos á sociedade e suprer a salta do canhamo, Rio de Janeiro, 1810, 8vo. In the two last there are some valuable notices on plants belonging to those regions*. This physician, a pupil of Gouan, has, besides, described rare plants from Pernambuco, drawn for him by Martins Ribeiro, who was fond of natural history (but who took a dangerous part in the revolution of 1816, which brought him to the gallows). This work, entitled 'Centuriæ plantarum Pernambucarum,' remained long in abeyance, until the drawings recently fell into the hands of the learned and diligent Dr. Franc. Freire Allemão, at Rio de Janeiro, who began in 1846 to publish single species, under the designation Trobalhos botanicos do Doutor Manoel Arruda da Camara, 4to, cum tab. The third name to be mentioned in this place, is Frey Leandro do Sacramento, who, as professor of botany at Rio de Janeiro, has introduced several plants from the province of Pernambuco, where he was born, into the gardens of the capital.

More important for our purpose are the contributions made by Dr. George Gardner, who visited Alagoas and Pernambuco, and travelled from Aracaty through the provinces of Ceará and Piauhy, made ample collections there, which he rendered accessible by selling them, and besides published much useful account of the vegetation of those countries, in his 'Travels in the Interior of Brazil,' London, 1846, 8vo. I have obtained additional materials through M. Schornbaum, a German gardener, located at Pernambuco. On the other hand, my undertaking is facilitated by the circumstance, that very many of the plants, concerning which Piso and Marcgrav render account, have spread themselves beyond the limits of those provinces, especially the useful plants recorded by them, which have long ago become known and employed in the tropical part of Brazil. The latter class of plants being frequently mentioned, imparts to our subject, above its matter of purely botanical interest, a predominating historical or ethnographical importance. But this very reason obliges us to extend our inquiries to

* Both treatises are reprinted in Koster's Travels in Brazil, and in the French translation of it. He has likewise published Memoria sobra a Canella do Rio de Janeiro; Rio, 1809, 8vo.

accounts of Brazil which, although of older date than Piso's and Marcgrav's, may yet serve to expand and complete those which we owe to them, and moreover were in part known to Laetius, their first editor. It may therefore not be out of place, if we offer here some literary-historical notices concerning those comparatively little-known sources.

The oldest information about the natural history of Brazil was given by the celebrated Jesuit Jos. de Anchieta, who already in the year 1553, had arrived, together with six other brethren of his order, in the province of S. Paulo, where he long continued to display much influential zeal in the conversion of the Indians, and the establishment of the Jesuits in the land. The information is, however, of little importance, as may be learnt from the edition published by the Royal Academy of Lisbon*.

The next accounts are those of Andre Thevet in his 'Singularités de la France antarctique, autrement nommée Amérique,' Paris, 1558, 4to. He came from Angoulême, and accompanied the French Maltese Knight, Nic. Durant de Villegagnon in 1555 to the country about Rio de Janeiro, but returned home so early as in January 1557. Notwithstanding the information he gives has been pronounced as untrue in the highest degree, especially by Léry, it has this much in its favour, that it is the first which makes us acquainted with some of the useful plants of the aboriginal inhabitants of Brazil. Thus we recognize with certainty *Ipomœa Pes-capræ*, Sw. (*Convolv. brasilianus*, L.) in Hetich, p. 53; *Genipa brasiliensis*, Mart., in Genipat, p. 59; *Nicotiana Langsdorffii*, Weinm., in Petun, p. 60; *Musa Sapientum*, in Pacovere, p. 61; *Thevetia Ahouai*, in Ahouai, p. 66; the Palm *Astrocaryum Airi*, in Hairi, p. 72; *Ananassa*, in Nana, p. 89; *Crescentia Cujete*, in Choyne, p. 105; *Manihot utilissima*, in Manihot, p. 114. The tree *Hyuourahe*, quoted at p. 96 b, as a substitute for *Guajacum*, is *Chrysophyllum glycyphlœum*, Casar. Decad. stirp. brasil. p. 12; and *Cæsalpinia echinata*, the genuine Brazil-wood, is described under the name *Araboutan*, at p. 116.

More accurate and complete is the account given by Jean de Léry, born at La Margelle, terre de S. Sené, in Burgundy, who in his twenty-

* Jos. de Anchieta epistola quam plurimarum rerum naturalium, quæ S. Vincentii (nunc S. Pauli) provinciam incolunt, sistens descriptionem a Didaco de Toledo Lara Ordonhez adjectis annotationibus edita, jussuque r. scient. Academiæ Olisiponensis ejus memoriis ad historiam transmarinarum nationum conscribendam proficientibus adjecta. Olisip. 1799, 4to.

second year accompanied, in the capacity of chaplain, the expedition which, at the instance of Admiral Coligny and the clergy of Geneva, was sent, in 1556, in aid of the colony of Villegagnon. He arrived in March 1557, in the bay of Rio de Janeiro, which he called Sinus genevensis, from the similarity of the environs. During a sojourn of more than a year he became acquainted with the principal useful plants of Brazil, and gave us the first trustworthy information concerning them in his work*. De Candolle, in noticing Léry's contributions†, mentions the circumstance that he was the first who announced the phytogeographical fact, of the plants of that country being equally different from those of ours, as the animals.

But of far greater importance is the botanical information contained in a work prepared at Bahia, at the close of the sixteenth century, and inscribed to the Councillor of State, D. Christovão de Moura, according to a dedication dated at Madrid, in 1589, or from the inquiries of Mr. F. A. de Varnhagen, in 1587. Had this work been published earlier, it would undoubtedly have possessed the claim of being the oldest source of sound and solid information concerning the natural and moral history of Brazil. It yields scarcely to any other work of that period in point of fulness, multiplicity, and fidelity of recorded facts, and comes nearest in comparison to Oviedo's 'Historia General de las Indias;' but fortunately it did not share the same good luck of speedy publication, but continued during a long time, in a few manuscript copies only, in the hands of some literary men. Frey Antonio de S. Maria Jahoatão availed himself of it in his chronicle, entitled Orbe serafico novo Brasilico, Lisb. 1761; so did Padre Manoel Ayres de Cazal, in his known Corografia brasilica (Rio de Janeiro, 1817, two vols. small 4to); Robert Southey in his History of Brazil (Lond. 1817 seq.), and lastly Ferd. Denis, according to a codex preserved in the Parisian Library (sub n. 609, supp. franc.), in his book: 'Univers, ou histoire et description de tous les peuples,' etc. (Paris, 1737, 8vo). At length the Royal Academy of Sciences at Lisbon published a copy, in

* Histoire d'un voyage fait en la terre du Brésil autrement dite Amérique. The first edition was issued at Rochelle in 1578; also the second in 1580. Three subsequent editions at Geneva, of 1585, 1594 and 1600, attest the great interest which Léry's report had excited. So late as 1794, a German translation appeared at Munster.

† Histoire de la Botanique genevoise, 1830, p. 3, and note A. Compare Lacroix du Maine, Bibl. franc. 1. p. 237.

their Collecção de Noticias para a historia e geografia das nações ultramarinas, etc. (vol. iii. pars 1), under the title of Noticia do Brasil, descripção verdadiera da Costa daquelle estado que pretence á caroa da Reino de Portugal, sitio da Bahia de todos os Santos. The author was unknown. According to a hint of Cazal*, I had formerly† considered a certain Francisco da Cunha to have been the author; until Franc. Ad. de Varnhagen, in his Reflexões criticas sobre o escripto do seculo XVI, impresso com o titulo de noticia do Brasil (in the Collecção das notic. ultamarinas, vol. v. pars ii., 1839) pointed out, that the author was Gabriel Soares de Souza of Lisbon, whom the 'Bibliotheca Lusitana,' vol. ii. p. 321, likewise quotes. According to the work just cited, this active man, who resided at Bahia, had moreover conducted the discovery and subjection (Conquista) of the country along the Rio de S. Francisco. But nothing is to be met with in the work itself, bearing directly on that expedition, or on another for the discovery of the emerald mines (Minas de Esmeraldas) which has likewise been attributed to him in the above book.

The natural-historical, and especially the botanical remarks, continued in this *Noticia do Brasil*, on account of their faithfulness and accurate localities, prominently conspicuous everywhere, deserve a critical review and a comparison with the writings of Piso and Marcgrav; I shall therefore extend my remarks to them, whenever occasion offers itself. They are more particularly important in a literary respect, inasmuch as they give a large number of names of plants in the idiom of the aborigines, and are therefore the most valuable sources for inquiries concerning the state of intellect these displayed in their knowledge of the surrounding nature. Those Indians, whom the Portuguese found inhabiting the sea-coasts, from the mouth of the Amazon River, to the bay of Rio de Janeiro, and thence still further to the southward, and with whom they soon became connected by the relation of supremacy, belonged to the widely extended nation of the Tupis. These Indios mansos, as they were denominated by the Potuguese, in contradistinction to the wild, free hordes of Nomads, the Indios bravos, or Tapuyos, who lived far inland, were themselves subdivided into many

* In the Corografia brasilica, i. p. 43, nota 20.

† Herbarium Floræ Brasil., in suppl. to Allgemeine botan. Zeitung, 1837, vol. ii. p. 3; and in Martius's State of Judicature among the Aborigines of Brazil, 1832, p. 5.

tribes, who waged war among each other, and whose language was diversified by various dialects. In consequence, the names of plants in the old accounts appear under manifold dialectic differences; which is the case, even at the present day, with regard to the language of that enigmatically dispersed nation of the Tupis*, the so-called Lingoa Geral, varying in many forms from the Guaranis, in the former *Reductions* of the Jesuits in Paraguay, to the half-civilized coast-Indians in the northern provinces. This circumstance renders all inquiries into the Indian nomenclature of plants difficult; but I believe I am warranted in assuming, that by a cautious critical analysis of those dispersed remnants of languages, many not unimportant facts relating to ethnography and phytology may be developed.

This same Tupis language prevailed likewise in the regions to the north of Ceará, namely at Maranhão; a circumstance to be mentioned in this place, because another still older writer must be named, who has left us some accounts of plants not to be neglected in reference to those inquiries; namely Claude Abbeville. He accompanied the French expedition from Bavadière and Rasilly, which had settled on the island of Maranhão from 1611 to 1615, and founded there the town of S. Luiz. Here too we meet with several not unimportant notices, especially of the useful plants of that place.

For the sake of convenient reference it will be proper to treat of the plants in this Commentary according to their natural families. We shall accordingly commence with Cryptogames.

(*To be continued.*)

Journal of a Voyage up the Amazon *and* Rio Negro; *by* Richard Spruce, Esq.

(*Continued from p.* 192.)

Towards the end of January I crossed to the south side of the Rio Negro, to visit a campo on which Senhor Henrique many years ago established a cattle-fazenda. He had at various times gone to considerable expense in procuring cattle from the Rio Branco, but from various causes they have never prospered. The grasses on the campo

* Compare Martius's State of Judicature among the Aborigines of Brazil, Appendix, pp. 1–5.

are of poor quality; when the winter-floods are very great, many of the cattle perish; the neighbouring forest is much infested by onças; and, worse than all, the herdsman is of a very indolent disposition. Between the south bank of the river and the campo is an intervening gapó, or forest of low trees and bushes flooded in the rainy season, of two or three miles in width. The water had risen sufficiently to enable my boat to traverse great part of this, and it was curious work navigating among bushes. In the narrow strip of forest which we had to traverse on foot, I found a pretty leafless *Voyria*, with snow-white flowers. The campo is about a mile broad, and three or four miles long; its southern side is skirted by a small river (the Janauarí), which enters the Rio Negro near the mouth of the latter. The herdsman's house is near the Janauarí; it is built of mud and thatched with palm-leaves, after the fashion of the country, but through the negligence of its inhabitants it has fallen much to decay, especially as to the roof; and the herdsman, rather than be at the trouble to cut palm-leaves to repair it, had a few months previously removed his family across the river to a small "casa do fôrno*," which stood near his mandiocca-plot, and was the common property of two or three families. I had my choice between these two habitations. But the oven-house was merely a roof supported on poles without any side-walls, and so many hammocks were suspended in it that there seemed no room for another, and certainly not for my operations. The house on the campo was so surrounded by mud and water as to be inaccessible save at one corner, where a plank was laid to step on. It consisted of three rooms, or "quartos;" there were pools of water on the floor of all these save the middle one, and in this were two opposite doorways without doors or mats, through which the trovoados swept furiously. This room I chose, preferring cold to wet, and here I remained a week, accompanied by a young fellow, a half-Indian and brother-in-law of the herdsman, who cooked my meals.

The soil of the campo is a stiff clay, while the campos I have previously visited are of loose sand; I was therefore prepared to expect something new in the vegetation, nor was I disappointed. The brittleness of the Grasses was quite in contrast with the tenacity of the soil; and I was not able to draw a single root without the aid of my knife.

* The mandiocca fôrno, or oven, is generally erected on the skirts of the roça and near a running stream. Where two or more roças join, a single fôrno often serves for drying the produce of all.

They consisted principally of three or four *Paspalums* and as many *Panicums*, and there were mixed with these a good number of *Cyperaceæ*—one of them (a *Scleria*) a most abominable 'Tiriríca,' or cut-grass, by walking among which my shins were completely tattooed. As is mostly the case on plains within the tropics, these Grasses and Sedges grew chiefly in solitary tufts, with bare spots of earth between them. Where the soil was rather peaty, in these bare spots, grew a leafless *Utricularia*, with a broad compressed tridentate spur, and a pretty Sundew, with leaves smaller than those of our *Drosera longifolia*, but with a much larger rose-coloured flower. In drier parts of the campo grew three Orchises, of the genus *Habenaria*, one with a long raceme of greenish-white flowers; a second with shorter racemes of yellow flowers, and so abundant as to recall the Bog Asphodel of our northern moors; the third, which had rather larger yellowish flowers, was more scarce, but it possessed the delicious scent of *Orchis conopsea*, wanting to the other two. Along with these grew a slender erect *Polygala* (near *P. brizoides*, St. Hil.), but eighteen inches high, with racemes of purple-and-white flowers; an *Amasonia*, probably new; a couple of *Turneras;* two or three herbaceous *Rubiaceæ*, etc. In very bare places, as the water began to cover the soil, sprang up a minute *Sauvagesia*, barely three inches high, with pretty pink flowers. In drier ground towards the skirits of the campo, grew a small species of *Arum*, with a spathe of pure white and a hemispherical root, the plane side being downwards. With this was a large branched herbaceous *Polygala* with white flowers.

Large ant-hills here and there by their decay form a sort of island in the marsh; on these grew two *Liliaceæ*, one with a solitary radical yellow flower, the other with a few terminal rather large flowers of the most delicate pale blue.

On one side of the campo the soil seems better, and Grasses and Sedges grow rank and high. This part is quite glorious with a shrubby *Melastoma* of four or five feet high, completely clad with large purple flowers: it is quite new to me. Scattered stunted shrubs of a *Byrsonima* and a *Curatella* formed the sole arborescent vegetation of the central part of the campo; but it was belted round by tall Jauarí Palms (*Astrocaryum Jauari*, Mart.), with an inner fringe of Mimosas, Myrtles, Melastomas, Malpighias, etc.; while outside of all, the dense dark forest stretched away to an immeasurable distance.

Not a day passed without rain. Sometimes there was sun enough in the morning to enable me to dry my paper before setting out to herborize. When there was not, I took the paper across the river in the evening and got it dried on the fôrno. It should be mentioned that the Casa do fôrno was not directly across the river, but that, embarking opposite our hut, we had to ascend about a quarter of a mile before landing on the other side, near the fôrno. The Janauarí is a narrow rapid stream, winding through dark forests, the climbers of which often stretch across it, and are troublesome to avoid as the canoe shoots beneath them. The first time I made the passage, along with my attendant Pedro, he placed himself in the prow and I in the poop of the canoe, each with a paddle; but although I was well accustomed to steer by means of a rudder, I had never attempted it with a paddle, and my want of dexterity brought us up every now and then plump into the bushes, which I could see ruffled Pedro's equanimity no little. After we landed, I heard him say to his sister in Lingoa Geral, "This man knows nothing—I doubt if he could even shoot a bird with an arrow!" (a feat which every boy of twelve years is supposed capable of performing). I consoled my wounded vanity with the reflection that probably the most eminent botanist in Europe would have cut no better figure than I did, if placed in the stern of an Indian canoe with a paddle in his hand. Since that time however practice has rendered me tolerably expert at steering with a paddle, or, as it is called, "handling the jacumá."

Observing some large roots, looking like turnips but vastly larger, lying near the house, I inquired what they were, and was told that they were used in the same way as the roots of mandiocca. They showed me the grated root in a state of preparation, and gave me farinha already made from it. It is only very lately (as I learnt from these people) that the Tapuya Indians have begun to use this root, and it seems to have been first made use of by the Purupurú Indians, inhabiting the Rio dos Purús, a large river whose course is parallel to that of the Madeira; these Indians call it *Bauná*. It is known also to the Mura Indians, who call it *Maihão* (the *h* slightly guttural). The Tapuyas call it merely *Maniacca-açú*, or the Great Mandiocca, having no original name for it. The largest root I saw weighed forty-eight pounds; I would have sent you it, if I could have found any one to carry it across the campo. I send you two roots, the larger of which weighs above

thirty-two pounds. I am told that far larger roots than any I have seen are sometimes found.

On the following day I went, accompanied by an Indian, to see the Bauná plant, which grows pretty abundantly in the forest on the south side of the Janauarí. We found several plants, and I procured specimens of the stem and leaves, and dug down down to the roots, but there were no flowers or fruit. It is a Sipó, belonging I have little doubt to the Order *Menispermaceæ*, and very like one of the same Order I have gathered near the Barra in fruit, and am sending to Mr. Bentham under No. 1227; the latter has however a slender branched root. I add here a description of the Bauná :—

Root more or less obconical in form, rounded at the edges, 1–2 feet in diameter by about 10 inches in depth, terminating in a long slender tap-root beset with radicles; the skin yellowish, rugose, the internal substance white, compact. Stem twining, the thickness of the thumb, subcompressed, sparingly branched; bark angular, peeling off; wood soft, distinctly zoned. Young branches and short petioles clad with ferruginous appressed pubescence. Leaves alternate, rather distant, 7–8 inches long by $2\frac{1}{2}$–$3\frac{1}{2}$ inches broad, oblong, subunequal-sided and the midrib slightly curved, obliquely and subabruptly apiculate, smooth save minute sparse pubescence on veins, which are prominent beneath.

This species gives the most tapioca, but there is another very similar one with leaves of equal dimensions, but equal-sided, with a few scattered minute hairs (some stellate) on upper surface, and beneath densely stellato-pubescent.—I send specimens of this also.

The Bauná root is still more poisonous than that of the mandiocca, though quite tasteless when fresh, and repeated washings are required to render the farinha and tapioca wholesome. When the herdsman's wife first tried the Bauná, she gave some of the grated root, with the juice merely squeezed off, as is done with the mandiocca, to the dogs, who devoured it greedily, but vomited the whole of the following night. A family in the mouth of the Rio Negro, being less cautious, ate of the roasted (but unwashed) grated root, and the experiment nearly cost them their lives. When properly prepared, the farinha of Bauná is scarcely distinguishable from that of mandiocca; for three days I lived solely upon Bauná and milk (with the exception of once eating a bit of broiled fish), and found it wholesome and nutritious.

Soon after my return from the Janauarí, I learnt that after my de-

parture a number of Indians residing on the river went to the herdsman's house in a body, and expostulated with his wife in the most angry manner, for her thus revealing to a stranger the source of their support in times of scarcity. "The people of the Barra," said they, "will cross the river to search for this root in our matos, and will speedily eradicate it. The Commandante, too, having heard of the narrow escape of this family in the mouth of the river, will send to forbid our making further use of such dangerous food." Their alarm was as great, and equally as well-founded, as that of a trader up the Rio Negro, from whom Dr. Natterer procured seeds of salsaparilha. "I considered to myself," said the man afterwards to Senhor Henrique, "what a fatal blow would be struck to our trade in Salsa if this foreigner should succeed in getting the seeds to grow in his country, where whole plantations would speedily be made of it: I therefore *boiled* them before I gave them to him!" I do not suppose Dr. Natterer ever learnt how it was that his seeds had lost their vitality.

On the Janauarí I saw a small plantation of Ipadú, a shrub of which the powdered leaves are chewed by the Indians throughout the Rio Negro. I found it to be (as I had expected) the *Erythroxylon Coca*. The Ipadú-powder is prepared in this way:—the leaves are pulled separately off the branches, roasted, and pounded in a mortar made of the trunk of the Popunha Palm, from six to nine spans in length, the root of the palm being left on for the bottom, and the soft inside scooped out. It is made of this excessive length on account of the impalpable nature of the powder, which would otherwise fly up and choke the operator; and it is buried a sufficient depth in the ground to allow a person to work it with ease. The pestle is made of any hard wood. When the leaves are sufficiently pounded, the powder is taken out of the mortar with a small cuya fastened to the end of an arrow. A small quantity of tapioca is then mixed with it to give it consistency, and it is usual to add pounded ashes of Imbaúba (*Cecropia peltata*, etc.), probably on account of their saline properties. With a chew of Ipadú in his cheek an Indian will go two or three days without food, and without feeling any desire to sleep. I send you the powdered Ipadú, and flowering specimens of the plant. I wished also to send you the mortar used in preparing it, but no sum of money can purchase one. I find the greatest difficulty in inducing the Indians to part with many things of their own manufacture, the reason being that it would

be a work of time to replace them, and an Indian loves ease above all things. Not long ago I saw in the hut of an Indian a fishing-line most beautifully made of the bark of some tree. All my entreaties could not induce the man to sell it. "I need it," said he, "to procure me the means of subsistence—your money will not buy me such another, and it will be the work of weeks to supply its place." Such an argument admitted of no reply, and I could only regret that he looked with such a philosophical eye on money.

There is another campo near the Barra, on the north shore of the river, which differs much in every respect from the one I have described above. It is elevated about a hundred feet above the river, and the soil is a loose white sand. The vegetation is chiefly shrubby, and one shrub, a species of *Humirium*, is so abundant that the campo is called from it the 'Umirisal.' The fruit of the Umirí is said to be very agreeable; it is produced in the dry season. Another shrub or small tree, called *Ymurá-ceêm*, or "the sweet tree," grows in almost equal abundance, and the fruit is ripe in February. It belongs to the Nat. Ord. *Clusiaceæ*. The other shrubs include but few species; the principal being a *Myrsinea* and two or three Myrtles. But what rendered this campo most interesting in my eyes was that here and there on the burning sand were large patches of four species of *Cladonia*, two of them exceedingly like our common Rein-deer Moss, and a third with bright red fruit, looking quite like *C. coccinea*. When I add to this that everywhere among the bushes grew up a tall Fern (*Pteris caudata*, Sw.), scarcely distinguishable from our common Brake, it will easily be seen how strongly I was reminded of an English heath. There were however two Ferns, of the curious genus *Schizæa*—one preferring the most exposed situations, the other nestling under bushes, and both in considerable quantity; looking so very *tropical* as at once to dispel the illusion, if it had entered my head to fancy myself at home.

I noticed but two Grasses on this campo; one forming scattered minute tufts, and probably a species of *Microchloa*, though, if so, the genus is ill described in the 'Agrostologia Brasiliensis:' I found the same growing very sparingly near Santarem. On the skirts of the forest, where the ground is lower and moister, grew the second Grass, a tall leafy *Paspalum*. There were also a few tufts of a single grassy-leaved *Cyperacea;* and the only other herbaceous plants noticed were a spreading branched *Asclepiadea*, with very milky stems, few narrow

leaves, and pendulous lurid flowers, and an *Orchidea*, nine feet high (!), with broad fleshy distichous leaves, of which I have not yet seen perfect flowers.

The spot where we landed, in order to reach the Umirital, was rocky, and afforded me several plants: amongst them a third *Schizæa*, quite different from those on the campo, three *Pæpalanthi*, two or three Grasses, etc. The whole of this northern coast, above the Barra, so far as I have ascended it, is rocky, and forms my most profitable herborizing-ground.

The waters of the Rio Negro are rapidly approaching their upper limit, but it is not until some time in June that they will begin sensibly to go down. About that time I propose ascending the Rio Negro, and I have already purchased a boat suitable for that purpose. Before I set out I hope again to write to you.

I enclose my sketch of the base of a Samaüma tree on the Paraná-miri dos Ramos, mentioned in the account of my journey from Santarem to the Barra: possibly it may interest you. The pottery laid about the foot of the tree is all of Caraipé-ware:—*a* is one of the pots used for burning the Urucuri nuts in (as I mentioned in my account of the fabrication of India-rubber); *b* is a water-pot; *c* a frigideira, or frying-pan; *d* are alguidares, or ordinary earthen-vessels; and *e* is a large panella, or pan for cooking in. The basket is of strips of the petiole of the Bacába Palm. The black tuberculated mass between the two forks of the tree is the nest of the Cupîm ant (a species of termite), and the rough black lines on the trunk below are the covered ways leading to the same. The twiners had been cut away in great part, to make room for a scaffolding which was erected in order to lop off one of the limbs; but there were still left portions of a large Araceous plant, and of a Papilionaceous twiner, probably a *Dalbergia*; besides a few others, whose foliage was hidden in the crown of the remaining limb.

As I previously mentioned, this tree measured eighty-five feet round a little above the base, but as the trunk divides into two, its dimensions may appear not so very extraordinary. If I am not mistaken, I have seen at a distance still larger Samaümeiras with a single trunk, and I cannot doubt that this tree quite equals in dimensions its celebrated African relative, the Baobab. On the Amazon the trunks are often hollowed out into immense casks, in which the oil of the turtle or of Cupaüba is collected, and thus floated down to Pará. Senhor Hen-

rique once brought down the Solimões a "cucha" of Samaüma, about twenty-seven feet long, and so thick that in hollowing it out a man could work inside it with an adze or a short axe. It held above three hundred pots of turtle-oil, each pot twelve frascas or six gallons, and therefore in all nearly 2000 gallons. Some time previously he purchased one ready-made, that had been cut down and hollowed out on the banks of the Ucayali, and, though not full, held three hundred and seventy-five pots of oil, or somewhere about 2250 gallons! When we arrived here from Santarem, a cucha from the Solimões entered the port along with us; it contained two hundred pots of Cupaüba oil.

The Samaüma is confined to the vicinity of white waters, and, though frequent along the shores of the Amazon, disappears the moment we enter the Rio Negro.

(*To be continued.*)

Note on the LEONIA CYMOSA, *Mart.; by* GEORGE BENTHAM, ESQ.

The genus *Leonia*, first established by Ruiz and Pavon (Fl. Per. et Chil. vol. ii. p. 69. t. 222), and subsequently characterized in detail by Martius (Nov. Gen. et Sp. vol. ii. p. 86. t. 168, 169 et 200), and by Alph. De Candolle (Prod. vol. viii. p. 668 in adnot.), has been generally considered as monopetalous and exstipulate; and the ternary parietal placentation being altogether anomalous among *Corolliflorœ*, after various attempts to associate it with *Myrsineœ*, *Sapotaceœ*, and *Ilicineœ*, it has been finally proposed to abandon all affinities by calling it an Order of itself. A careful examination of the specimens in flower and fruit communicated by Mr. Spruce, of the *L. cymosa*, induce me to suggest a widely different position; slightly indicated indeed by Alph. De Candolle in his reference to an affinity with *Tetraphylacium*; but not recognized hitherto, on account of the supposed absence of stipules. As that proves to be a mistake, the plant becomes a genuine *Violacea*, of the tribe *Alsodeiœ*.

The stipules of *Leonia cymosa*, though small and very deciduous, exist in the young shoots, and always leave a permanent scar. The foliage is precisely that of an *Alsodeia*. The petals, but slightly coherent at first, are when the flower is expanded either quite free, or

very easily separable, and only differ from those of *Paypayrola** in being shorter, the staminal apparatus is precisely that of the latter genus. The berry and seeds cannot be distinguished from those of other baccate *Violaceæ*. Specimens indeed in fruit of *Leonia cymosa*, from Mr. Spruce's Barra collection of last year, appeared to me so evidently Violaceous, that I distributed them under the name of *Amphirrhox?* sp. n., the absence of flowers preventing my recognizing them as belonging to *Leonia*, which I did not then possess. The flowering specimens now received, were, like those in fruit, gathered in the Capoeiras and shady forests about Barra do Rio Negro, and will be included in the distribution now going forward.

BOTANICAL INFORMATION.

Ringgold's United States Scientific Exploring and Surveying Expedition.

(*From the 'New York Journal of Commerce.'*)

This expedition consists of five vessels under the command of Commander Cadwalader Ringgold, which have been equipped, rigged, and manned with a view to the peculiar service for which they are designed; a service of the utmost importance, not only to our country, but to the entire world, as it is intended to examine and survey a large portion of the North Pacific Ocean, Behring's Straits, and the Arctic Sea, so far north as may be found practicable, together with the adjacent coasts of America and Asia,—these surveys having for their object the promotion of commerce and of the whaling business in those greatly frequented, but slightly known regions. The various groups of islands lying in the track of the shipping trading on the North Pacific are to be visited and accurately surveyed, and the Chinese, Sooloo, and Celebean seas, with their numerous islands, straits, and harbours, which are now either unknown, or very imperfectly ascertained and located, and through which hundreds of our vessels will be trading with the East Indies, are

* See Tulasne's admirable account of this genus in Ann. Sc. Nat. Par. ser. 3. vol. vii. p. 368. My genus *Periclistia*, Hook. Journ. Bot. vol. iv. p. 108, must be reduced to *Paypayrola*. I had been misled by the errors in Aublet's drawing, now corrected by Tulasne.

to be laid down upon charts with the utmost accuracy, from data obtained from actual surveys.

The localities and true position of the Aleutian Islands, which stretch nearly across the Northern Pacific, and from the southern boundary of the Behring or Kamtchatka Sea, and the Kurile Islands, which extend from Japan to Kamtchatka, will be examined and defined; and the Sea of Okhotsk, the Islands of Japan, with the adjacent seas, as well as the Gulf of Tartary, and the approach and entrance of the large river Amour, will form a portion of the scientific labours of this extensive survey. All this labour, immense as it seems to be from this detail, is to be performed by this Expedition, and it is expected they will be thus occupied for a period of between four and five years. The officers are not novices in scientific surveys and examinations. Commander Ringgold, now at the head of the Expedition, was Commander of the Porpoise in the Exploring Expedition under Com. Wilkes; Lieut. H. Rolando commands the Vincennes, the flag-ship; Captain Davis, now commanding the Porpoise, was also an officer in the Exploring Expedition; Lieut. Stuart, the Secretary and Assistant Astronomer, was the Draughtsman of the exploring Expedition; Captain Rodgers, now commanding the steamer John Hancock, is also advantageously known as a gentleman of fine scientific mind and attainments; [and we may add, that the chief Botanist, Mr. Charles Wright, is favourably known by the extent and value of his collections in California and New Mexico.]

The expedition consists of five vessels, viz. the Vincennes, sloop of war, now converted into a bark, with an armament of four long 32-pounders, and four eight-inch shell guns, on the gun or main deck; three brass pivot howitzers on the spar-deck (these howitzers are mostly beautiful pieces, made at Washington City, expressly for this expedition), and one 12-pounder, a field-piece, to take on shore in case of an emergency. The small arms consist of percussion-lock muskets for the marines, Sharp's rifles, loading at the breach, with Maynard's primers, for the use of seamen, and so arranged that they will be slung at the back of each sailor while he is rowing in the boat, entirely out of his way, aud yet can be brought to his shoulder and discharged at a moment's notice; and also the most improved revolvers, together with cutlasses and boarding-pikes. The steamer John Hancock, of about 800 tons, is bark-rigged, with an armament consist-

ing of one 24-pound and two 12-pound brass pivot howitzers, of the same description with those above-mentioned, and also small arms of a similar character with those used in the Vincennes. The brig Porpoise is armed in the same manner as the steamer Hancock, with the addition of two 32-pound long guns; as is also the survey and supply ship John P. Kennedy, with the exception of the 32-pound cannon. This ship is about 500 tons burden, and is also barque-rigged. The schooner Fenimore Cooper is an elegant model of a pilot-boat, about 90 tons, and armed with one 12-pound brass pivot gun, and small arms similar to those used in the other vessels. All the boats of the squadron, especially the launches, are whale-boats, and one boat of each vessel is provided with a brass 12-pound pivot-gun. Each vessel is also furnished with life-buoys, with port-fires attached, a number of India-rubber boat floats, and a full supply of life-preservers. Among the additional means of carrying into effect the objects designed, the Expedition is provided with the most improved astronomical, surveying, and magnetic instruments, the most of which have been manufactured in the United States, and with the utmost care and accuracy, and they have been very highly spoken of by all who have had the gratification of seeing them. The chronometers, being about thirty in number, are of the best quality which could be procured. Besides the complement of officers of the Navy, who, under the direction of Commander Ringgold, will have the charge of the astronomic, hydrographic, and magnetic departments, an efficient scientific corps is attached to the Expedition. All the departments of Natural History will be attended to. Competent draughtsmen are also provided; and among the scientific gentlemen there is a photographist, chemist, taxidermist, artist, and a mathematical instrument maker. In truth, care has been taken in the organization of this service, to furnish it with every means of success.

The Vincennes is fitted up especially under the eye of Commander Ringgold, and a more beautiful, comfortable, and splendidly arranged ship probably was never before seen. Her beauty and splendid arrangements do not consist in tawdry colours and gilding, for she has nothing in her but plain white and mahogany; but it consists in having a place for everything, and everything in its place, and in the occupation of every possible nook and space, for some valuable purpose. A more perfect arrangement and disposition could scarcely have been devised. In the cabins of this ship are contained a most valuable library

of scientific and other works, voyages, histories of previous expeditions, etc., consisting of about one thousand volumes. This library is for the use of the officers alone. In the midships is another library intended for the use of the seamen, showing that every care has been taken to render this long voyage interesting, not only to those in command, and to the scientific gentlemen, but also to poor Jack.

Many have confounded this Expedition with that of Japan, under the command of Commodore Perry, and we have even seen instances in which newspaper articles, in giving a list of the vessels composing the Japan Expedition, have enumerated those, or some of them, belonging to the present one. This is an error. Our understanding is, that there is no necessary connection between the squadron of Commodore Perry and that of Commander Ringgold, and that they are organized for entirely separate and distinct purposes.

Notes on the state of Botany in Italy. (From the 'Bonplandia.')

Florence, March 17, 1853.

I have little news to give you this time. No recent publications have come to my knowledge, except a few on the disease of the Vine, which continue to appear every now and then. One is by a committee named by the authorities of the district of Calatagirone in Sicily, to investigate the subject. Also the Accademia dei Georgofili of Florence, in its sitting of February last, heard several papers on the same subject; the principal one, botanically speaking, was that of M. Adolphus Targioni, who tried to prove that the Fungi of the genus *Oïdium* are only forms of *Erisyphe* in a peculiar state of development; without pretending to give an opinion on this question, I must remark that the proofs brought forward by M. Targioni in support of his views seem to me little conclusive.

I am informed that Professor Sanguinetti has tendered his resignation as director of the Botanical Garden at Rome, but that he is going to retain the professorship at the University. Another piece of news from Rome is that the councillor of that city, M. Vescovali, with the aid of a French gardener, is replanting the Pincian promenade with exotic trees adapted to the climate, and that they mean to have the trees ticketed with their names and country, for the instruction of the Roman people.

Dr. Gibson, director of the Botanical Garden at Bombay, was here a few days ago, on his way back to India.

Professor Parlatore's portrait had been drawn and engraved: the likeness is striking, the engraving itself excellent as a work of art, and the price of the picture about three francs.

The Camphor-tree of Borneo.

The following information has most obligingly been communicated to us by 'An Admirer of Science,' in a letter dated Hackney, April 4, 1853. "In an article extracted from your 'Journal of Botany' for December last, on the Camphor-tree of Borneo and Sumatra, it is stated that the first mention of that particular kind of camphor known to you is by the traveller Camoens, who died in 1579. I have been lately reading an edition of the travels of Marco Polo, by Hugh Murray, F.R.S.E. (second edition, Edinburgh, Oliver and Boyd, 1844), and find there (p. 287), where the traveller is giving an account of the kingdoms of Sumatra, under the head of Kingdom of Fansur, the article in question is spoken of in the following terms:—'Here grows the best *Canfara fansuri*, which is much more valued than any other; indeed, it sells for its weight in gold.' Now, as it appears that Marco Polo was not released from Genoesi prison till the year 1299, 'where the travels were penned,' it follows that mention was made of the Sumatran Camphor 272 years previous to the time mentioned in your article."

Thus we have, in the case of the Borneo and Sumatran Camphor, a plant known to travellers five centuries and a half before it is known to science!

Water in Potatoes, etc.

Wonder, and often doubt, have been expressed as to the amount of water exhibited in the Museum of Economic Botany of the Royal Gardens, in illustration of the analysis of the common potato. We copy the following article, which lately appeared in a scientific journal:—Potatoes contain 75 per cent., by weight, and turnips no less than 90 per cent., of water. A beefsteak, strongly pressed between blotting-paper, yields nearly four-fifths of its weight in water. Of the human

frame (bones included) only about one quarter is solid matter (chiefly carbon and nitrogen), the rest is water. If a man weighing 10 stone were pressed flat under a hydraulic press, $7\frac{1}{2}$ stone of water would run out, and only $2\frac{1}{2}$ stone of dry residue would remain. A man is therefore, chemically speaking, 45 lb. of carbon and nitrogen diffused through $5\frac{1}{2}$ pailfuls of water. Berzelius, indeed, in recording the fact, justly remarks that the living organism is to be regarded as a mass diffused in water; and Dalton, by a series of experiments tried on his own person, that of the food with which we daily repair this water-built fabric, five-sixths are also water. Thus amply does science confirm the popular view that water is the first necessary of life.

Mexican Collections.

Matteo Botteri, an accomplished Dalmatian Naturalist, has been engaged by the Horticultural Society to collect for them in the southern part of Mexico. He will be allowed, after delivering to the Society the collections that he has stipulated to make for them, to offer for sale on his own account dried plants, shells, insects, and other objects of Natural History, and has appointed Mr. Stevens, of 24, Bloomsbury-street, as his agent.

M. Botteri has been several years engaged in similar pursuits in Dalmatia and the neighbouring parts of Turkey, and will take with him, as asssistant, a countryman of his own, who has been in the habit of accompanying him. He is expected to be in England, on his way to Mexico, about the beginning or middle of August, and will bring with him a collection of Dalmatian plants, shells, and insects.

NOTICES OF BOOKS.

Harvey, Dr. William Henry: Nereis Boreali-Americana; *or, Contributions towards a History of the Marine Algæ of the Atlantic and Pacific Coasts of North America.* Part II. Rhodospermeæ. Royal 4to, pp. 258, Tab. XIII. to XXXVI., representing 67 species.

The Second Part of this important work comprises the most attractive portion of the Algæ, and far exceeds in size and in number of illus-

trations the former part, which consisted of the more dingy-coloured species. Every frequenter of our coast has been more or less struck by the beauty and elegance of these productions, which are in consequence favourite objects of collections, and the interest is much increased when the structure is observed even under low magnifying powers.

The RHODOSPERMEÆ are not however wholly confined to salt water. The genus *Bostrychia* not only occurs in brackish water, but some grow even in perfectly fresh water, in mountain streams far removed from the sea. The same species, as in the case of *B. vaga* of Kerguelen's Land, may occasionally be traced from the rocks and stones about high-water mark to a considerable distance inland. Six species of this division, belonging to the genera *Bostrychia*, *Gymnogongrus*, and *Ballia*, have been found by M. Leprieur in Cayenne at a height of from 100 to 150 mètres above the level of the sea; and though occurring at a distance from the shore, they have precisely the same smell, and probably the same chemical properties, as their salt-water congeners.

As regards the execution of the work, which we hope will be widely diffused in this country, we may remark that the figures, all of which are coloured, are just in the style of those of the 'Phycologia Britannica,' and give all that can be attained at so moderate a price; and notwithstanding a larger outlay, though neither necessary nor practicable, might have secured in some instances a greater degree of neatness and precision in the colouring, nothing is wanting to the general effect of the illustrations; and the dissections are well made out, and available at once for the purposes of science.

The importance of this work is by no means confined to any general physiological interest which may be attached to the subject, much less to any restricted local or national claims, but the student in all parts of the world, and more especially in our own latitudes, will find it quite indispensable to the satisfactory advance of his knowledge. For not only are the geographic details most important and often most precise, but there is so much similarity between the American and European species, or between certain groups and those of other countries, that henceforth no student who makes any pretensions to due research can safely profess his ignorance of these volumes. We know indeed that both in this and other countries works have appeared betraying the most complete ignorance of contemporary labours; but the inevitable

fate of such books is ultimate neglect, for we hold it as a well-established law, that every one who writes upon a subject is not only bound to take every possible pains to acquire a perfect knowledge of all that has been written previous to his own attempts in the same line, but must do so if he has any regard for his reputation.

Another very important point presented by this work is the full and ample commentary which it presents, both in the way of remark and illustration, on the more recent labours of the younger Agardh, than whom no one has done better service to this branch of science, which has been perplexed more than most others with ill-defined genera, so as to make it for a long time the reproach of natural history. The figures and dissections will enable many to read the works of Agardh with more profit, and may ultimately lead to a more accurate knowledge of many obscure points, in the hands of persons favourably situated for observation.

We think it, at the same time, a great merit that Dr. Harvey has not attempted to throw out any new system of his own, though he has not hesitated, where he saw good cause, either to dissent or amend, and he has established several good and interesting genera.

A single instance of this mode of disposing of needless genera will give a good example of the sort of matter to be met with in the more general observations.

"A considerable number of species"—speaking of *Nytophyllum*, Grev. —"have been described, which Kützing divides into three genera, *Aglaiophyllum*, *Schizoglossum*, and *Cryptopleura*, distinguished by some differences in the structure of the frond. *Aglaiophyllum* is limited to those genera which are altogether nerveless, and have a membrane composed of a single stratum of large cellules; *Cryptopleura*, to those in which nerves are more or less obvious, with a similarly constructed membrane; and *Schizoglossum*, to such nerveless species as have a membrane composed of one stratum of cellules. I do not adopt these. genera, because I find the characters untenable. The more or less nervated frond varies even in the same species; *Schizoglossum Gmelini*, Kütz., for instance, which ought by generic character to be nerveless, is frequently abundantly supplied with nerves, much more abundantly than *Cryptopleura Bonnemaisoni* and *C. Crozieri*. The character founded on compound structure is equally nugatory, for *Cryptopleura lacerata*, which is moreover the type of the genus so called, has a frond

constructed of more than one row of cellules, contrary to the generic character. There is, indeed, a most close affinity in structure between *S. Gmelini* and *C. lacerata*, and they cannot be separated generically without violence."

From the very nature of the case, Dr. Harvey has not been able to add much to our knowledge of the curious matters which have lately occupied the investigations of Thuret, Derbès, and Solier; but the work is not altogether without information on these points. The antheridia, for instance, are figured in *Polysiphonia ramentacea*. Many useful practical observations are interspersed amongst the commentaries; as a specimen we extract a passage under the article *Polysiphonia*, which may be useful to some of our readers. "In studying the species, it is absolutely necessary to make cross sections of the stem, in order to be able to count the number of primary tubes in each internode; for though the exact number is not of specific importance in the Polysiphonous species, where we find the same species varying in different specimens from twelve to twenty tubes, yet it is essential to determine whether there be only four or more than four; and, generally speaking, the species with fewest tubes are most constant to their number. A little practice will enable the student to make the necessary sections, with the help of a small-bladed knife, and a botanical simple microscope, for which may be substituted a watch-maker's eye-glass. A small piece of a stem or branch, say a quarter of an inch long, is firmly held by the finger of the left hand upon a slip of glass under the lens, while thin slices—the thinner the better—are cut from it. These wheel-like slices, floated in a drop of water, may then be placed under the compound microscope and examined. In slicing dried specimens, it is best to cut the stem if possible before it be moistened, as a thinner and cleaner cut can then be made, and the risk avoided of the too rapid decomposition from the fresh water. When the cells refuse to resume their proper shape on remoistening, a drop of muriatic acid will frequently, but not always, expand them."

Such remarks are very valuable to the young student; and as everything esoteric is happily vanishing from science, it is no shame to be able to say with sincerity and intelligence, even in such matters, "virginibus puerisque canto."

List of MR. PLANT'S NATAL FERNS; *by* MR. THOMAS MOORE.

The following notes have reference to a small collection of Natal Ferns, made last year by Mr. R. W. Plant, which have just reached the hands of Mr. S. Stevens, who has a few sets of them for disposal.

1. (317.) Polypodium *incanum*, Sw.—Zwart-kop, on trees; elev. 2500 feet.

2. (316.) Phlebodium (§ Pleopeltis) *lanceolatum* (Pleopeltis, *Kaulf.;* Polypodium lepidotum, *Willd. herb., fide Kze.*)—Impafane, on trees, in open bush; elev. 3000 feet.

3. (309.) Niphobolus *Africanus*, Kze.: var. *major.*—Umgoe mountains, on large trees in the forest.

4. (311.) Drynaria *vulgaris*, J. Sm.—Bush along the coast.

5. (312.) Acrostichum *aureum*, L.—Bay of Natal, close to high-water mark.

6. (308.) Stenochlæna *scandens*, J. Sm. (Lomaria Meyeriana, *Kze.*) Climbing up large trees in damp ravines, near the coast.

7. (322.) Adiantum *æthiopicum*, L.—Moore River; ravines.

8. (318.) Cheilanthes *firma*, n. sp.; fronds (1–1½ feet) glabrous, coriaceous, pentagonal, the apex acuminate, tripinnate, or quadripinnate in the inferior pinnules of the lower pinnæ, which are much the largest, obliquely deltoid, their inferior pinnules twice the size of the superior ones; primary pinnules (of lowest inferior pinnæ) pinnate, the divisions (secondary pinnules) distant, ovate-lanceolate, deeply pinnatifid, the segments oblong, bluntish, with crenated margins; the lowest secondary pinnules distinct, stalked, the intermediate ones petiolulate or sessile, lanceolate, oblong, scarcely pinnatifid, the uppermost ones coadunate into a tapering point; apices of the frond and pinnæ with decrescent coadunate pinnules; stipes (imperfect) and rachises smooth, shining brown, terete behind, channelled and margined in front; sori contiguous or continuous, the indusium lobed and crenate.

Differs from *C. Atherstoni*, Hook., to which it appears to be related, in its more robust habit, and in the larger size and different form of its pinnules. The veins are distinct, depressed on the upper surface, and running out into the sinuses of the marginal crenatures. In the smaller specimens (6 in. excl. stipes) the involucres are distinct and scale-like; in the larger ones, which measure 1 foot in length, excluding the imperfect stipes, and 1 foot across the lowest pinnæ, they are

continuous and quite pteroid.—Impafane, on the sides of mountain-streams.

9. (318*.) Cheilanthes *linearis*, n. sp.; fronds (6 inches) smooth, coriaceous, deltoid, quadripinnate; ultimate pinnules all distinct, small, linear, obtuse, the terminal one of the same form; sori copious, pteroid; indusium continuous, narrow, very slightly undulated; stipes (imperfect) and rachises terete behind, plane and margined in front, shining purple.

A few specimens closely allied to, and collected under the same No. with the last, but apparently distinct, though they may perhaps be the same species altered by exposure. It differs in being distinctly quadripinnate, in the pinnules being uniformly linear and equal-sized, the terminal ones distinct and of the same form, or rarely slightly auricled on one or both sides, not decrescent and coadunate as in *C. firma*. The surface of the pinnules too, in the latter, has the flexuose costa and forked veins deeply marked by depressed lines, while in *C. linearis* the surface is wrinkled and not lined.—Impafane, in rocky places.

10. (321.) Platyloma *Calomelanos*, J. Sm.—Quathlamba; hill-sides.

11. (326.) Pteris *hastæfolia*, Schrader (Allosorus, *Presl;* Cheilanthes hastata, var. stenophylla, *Kze.*).—Forest about Umvoti. Distinct from *P. hastata*, and according to Kunze reproduced with constancy from the spores.

12. (307.) Pteris *aquilina*, L.—Sandy hill-sides.

13. (310.) Asplenium *Dregeanum*, Kze.—Umgoe mountains, on damp rocks.

14. (323.) Asplenium *monanthemum*, Sm.—Quathlamba; bush. Sori frequently 2–3 on the lower half of pinnæ, sometimes 6–8 and arranged on both sides the midrib.

15. (327.) Asplenium *brachyotus*, Kze.—Quathlamba, 3000 feet.

16. (324.) Asplenium *furcatum*, Thunb.—Zwart-kop; deep ravines.

17. (328.) Asplenium *rutæfolium*, Kze. (Cœnopteris, *Berg.*)—Quathlamba, on trees, in wet ravines.

18. (313.) Lastrea *Plantii*, n. sp.; fronds ($1\frac{1}{2}$ feet) glabrous, ovate or subtriangular-lanceolate, tripinnate; pinnæ subopposite, deltoid (5–6 inches long, the basal pinnules $2–2\frac{1}{2}$ inches); pinnules linear-lanceolate, the lowest stalked, deeply pinnatifid with subfalcate lobes, the intermediate sessile, subfalcate, toothed, the uppermost confluent, all as well as the pinnules themselves directed forwards; sori crowded,

confluent, confined to the upper half of the frond in two lines along the pinnules, and almost concealing them; indusium large, tumid, reniform, very persistent; stipes (wanting); rachis shaggy with brown filiform scales.—Moore River; in deserted holes of the jackal. "The natives call it *I'Komo Komo*, and esteem it a sovereign remedy in dysentery." A very distinct species, with the aspect of *Arthobotrys*, Wall.

19. (325.) Lastrea *pentagona*, n. sp.; fronds (1–1¼ foot) coriaceous, glabrous, ovato-pentagonal, bipinnate; pinnæ acuminate, the lower pairs triangular and very unequal-sided; the inferior pinnules of the lowest pinnæ much longest, pinnate, with distant oblong-obtuse duplicato-serrate decurrent secondary pinnules having mucronate teeth; the superior pinnules as well as those of the upper part of the frond pinnatifid, with oblong-obtuse mucronato-serrate lobes; sori universal, distinct, forming two lines near the midvein on the primary or secondary pinnules; indusium reniform, persistent; stipes (1 foot) with pallid ovate-lanceolate scales; rachises sparingly clothed with small narrow-lanceolate scales.—Umvoti, in ravines and wet places.

20. (315.) Lastrea *patens?* Presl.—Moore river; ravines. Fronds ovate-lanceolate, and as well as the rachis densely hairy.

21. (328.) Polystichum *angulare*, Presl.—Swamps near the coast.

22. (329 *c.*) Trichomanes *pyxidiferum.*—No special habitat. Very like *T. Filicula* in aspect, but without the two-lipped involucre.

23. (320.) Loxoscaphe* *concinna* (Davallia, *Schrad.*).—Little Quathlamba range, on trees, in ravines. Elev. 3000 feet. The collection contained but one specimen of this rare Fern.

24. (314.) Cyathea *Dregei*, Kze.—Moore river. A tree-fern, with the stems 4 feet high.

25. (329.) Osmunda *regalis*, L.—Banks of the Amanzimdoti, near the coast.

26. (319.) Mohria *thurifraga*, Sw.—Bushman's river, on the sides of mountain-streams. Elev. 4000 feet.

27. (329 *g.*) Lycopodium *verticillatum*, L.—Makazan's country.

28. (329 *h.*) Lycopodium *gnidioides*, L.—Makazan's country.

* *Loxoscaphe* (from *loxos*, oblique, and *scaphe*, a skiff or boat) Nov. Gen. = *Davallia* § *Dareoideæ*, Hook. Sp. Fil. i. 192.—1. *L. concinna*, supra; 2. *L. Schimperi* (Davallia, *Hook.*); 3. *L. Lindeni* (Davallia, *Hook.*); 4. *L. gibberosa* (Davallia, *Sw.*). The compact subtufted habit and marginal sori sunk in a short oblique shallow boat-shaped cavity, and somewhat resembling those of *Darea*, indicate a distinct and natural group.

29. (329 *e.*) Lycopodium *cernuum*, L.—Umbilo.

30. (329 *i.*) Lycopodium *clavatum*, L. var.—Banks of the Pongolo.

31. (329 *f.*) Lycopodium ? *carolinianum*, L.—Banks of the Pongolo. —Barren specimens only.

32. (329 *d.*) Selaginella *rupestris*, Spring.—Umbilo.

P.S. I may take this opportunity to mention a remarkable Natal plant of dubious affinity, for which the Chelsea Botanic Garden is indebted to N. B. Ward, Esq. It was introduced about eighteen months since by Dr. Stanger, along with some other Natal plants, and would seem to be either a fern-like *Zamia*, or a zamia-like Fern; indeed I am informed it was referred to *Lomaria*, under the name of *Lomaria lagopus*, by Kunze, who had seen specimens of the leaves (taken for barren fronds, I presume) collected by Gueinzius. Its affinity appears to be however rather with Cycads than with Ferns; and some evidence collected by Mr. J. Smith seems to confirm this opinion. Whatever its affinity, there seems no doubt that it is perfectly unique as a genus; and pending the completion of the evidence on this point, I am desirous of provisionally dedicating it to its enterprising discoverer, in the full expectancy that more complete information will establish its distinctness.

STANGERIA, n. gen.

[*Fructification ?* a strobilus.] *Fronds* (or *leaves*) perennial, pinnate, the pinnæ (or leaflets) *inarticulate, costate, with divergent parallel forked veins.* *Stem* short, erect, simple.

S. paradoxa.

Stem simple, erect, swollen and turnip-shaped at top, with a small central crown, 6–8 inches long, somewhat rugged, but without any distinct cicatrizations, except close around the crown, as though the swelling of the stem had obliterated them; furnished at the base with stoutish brittle roots. Mature frond (1 only) rigid, enduring, in outline ovate, with a broad base, pinnate. Stipes 2 feet long (probably elongated by too much heat), almost terete, thickly covered with small short grey elongated dots, resembling appressed hairs, the base clothed with a felt of soft grey hairs. At its base on each side is a thick hard stipule-like scale of a broad triangular-ovate form. Pinnæ (twelve pairs) inarticulate, lanceolate, 6–7 inches long, more or less unequal at the base, the lowest petiolate (petioles there

an inch long) the petioles shortening upwards, the upper pinnæ becoming decurrent on the inferior side; all entire in the lower half, sharply serrate above, smooth, rigid in texture, with a stout midrib prominent on both sides, and divergent, parallel, translucent veins forked once or twice near the costa (very much as in *Scolopendrium*). Rachis two-furrowed above. The lower pinnæ stand forward from the plane of the frond.

HAB. Natal. Introduced by Dr. Stanger in 1851, to the Botanic Garden, Chelsea.

On some New Genera and Species of BRAZILIAN RUBIACEÆ; *by* GEORGE BENTHAM, ESQ.

SPRUCEA, *Benth.*
(Genus novum *Cinchonearum?*)

The *Rubiaceæ* collected by Mr. Spruce on the Amazon and the Rio Negro are numerous, and many of them constitute fine additions to the known genera and species of that Order. I have been preparing descriptions of most of them, in connection with a general revision of the American genera; but in the meantime I cannot resist the pleasure of dedicating to the discoverer a very handsome and remarkable shrub belonging apparently to the tribe of *Cinchoneæ;* and of making known at the same time two or three of the most interesting among his new *Rubiaceæ* belonging to other genera.

The *Sprucea* rubescens* was gathered in June, 1851, in the gapó at Manaquiry, on the south shore of the Amazon, at the mouth of the Solimões, where it forms a shrub of 6 to 9 feet. The whole plant, especially the leaves, flowers, and stamens, turn more or less red in drying. The flowers have a fine odour of Vanilla, the calyx and corolla are yellowish cream-coloured, the filaments white, the anthers pale yellow, but becoming quite vermilion in drying. The fruit being unknown, there may be still some doubt as to its place in the Order between *Cinchoneæ* and *Rondeletieæ*, although the general habit, stipules, etc., are so much those of the former tribe.

* I am aware that the name of *Sprucea* has been substituted by Mr. Wilson for the *Holomitrion* of Bridel, a genus of Mosses; but this change has neither been adopted by Müller, nor recognized by Mr. Spruce himself, nor does it appear to be required by the most generally received rules of nomenclature.

Char. Gen. Sprucea.—*Calycis* limbus 4–5-partitus. *Corollæ* tubus subgloboso-campanulatus, 5-sulcatus, limbi lobis minimis orbiculato-reniformibus patentibus, æstivatione leviter imbricatis. *Stamina* medio tubo inserta, longe exserta; filamentis crassiusculis basi dilatatis intusque villosis; antheris breviter oblongis. *Ovarium* biloculare, ovulis plurimis angulatis arcte appressis 1–2-serialibus. *Discus* epigynus carnosus. *Stylus* glaber, longe clavatus, striatus, integer v. demum apice bifidus, lobis revolutis.

Species unica: S. *rubescens*. *Frutex* 6–9-pedalis, ramosissimus. *Ramuli* juniores hirsuti, demum glabrati. *Stipulæ* utrinque solitariæ, lanceolatæ v. lanceolato-subulatæ, fere semipollicares, hirsutæ, caducissimæ. *Folia* breviter petiolata, ovata v. elliptica, breviter acuminata, basi obtusa, 4–6 poll. longa, 2–3 poll. lata, ad venas parce hirtella v. glabra, rigidule membranacea, summa minora et basi interdum subcordata. *Corymbi* terminales, densi, subcapitati, inter folia suprema breviter pedunculati, foliis multo breviores. *Bracteæ* infimæ stipulinæ, lanceolato-subulatæ, cæteræ late triangulari-ovatæ, membranaceæ, ciliatæ, ovario subæquales, caducæ. *Ovarium* sessile, anguste turbinatum, 1–1½ lin. longum, hirsutum. *Calycis* limbi lobi sæpius 4, parum inæquales, membranacei, triangulares v. lanceolati, acuti, 1½–2½ lin. longi, post anthesin (an in fructu?) persistentes. *Corolla* 4 lin. longa et lata, extus glabra, basi breviter contracta et lævis, dein fere globosa, 5-sulcata, brevissime et obtuse 5-loba, lobis erectis, lamina parva reniformi patente quasi appendiculatis; tubus intus ciliis paucis circa staminum insertionem munitus, corolla cæterum glaberrima. *Filamenta* basi in laminam corollæ tubum basi vestientem glabrum connata, dein libera, corolla duplo longiora, supra insertionem intus villosa. *Antheræ* erectæ, basifixæ, longitudinaliter birimosæ. *Stylus* staminibus æquilongus.

Eukylista, *Benth.*

(Genus novum *Cinchonearum*.)

Alabastra bracteis membranaceis clausis mox deciduis involuta. *Calycis* dentes vix conspicui. *Corollæ* tubus brevis; limbus expansus, lobis 6–8 æstivatione imbricatis; fauce intus densissime villosa. *Stamina* inter villos paucos inserta, corollam subæquantia, glabra; antheris ovatis. *Stylus* glaber, filiformis, lobis 2 oblongis intus planis stigmatosis. *Discus* epigynus brevis, annulatus. *Ovarium* biloculare,

placentis bifidis pendulis ultra medium dissepimento adnatis. *Ovula* numerosissima, sursum imbricata. *Capsula* septicide dehiscens, coccis subintegris intus hiantibus. *Semina* elliptica, compressa, apice et basi in alam lanceolatam integram sæpe inflexam v. difformem expansa. *Embryo* longitudine fere seminis, cotyledonibus ovatis, radicula supera brevioribus.

Species unica: C. *Spruceana*, Benth.—*Arbor* undique (ovario excepto) glabra. *Ramuli* teretes v. subcompressi, læves. *Stipulæ* caducissimæ cicatricem relinquunt annularem, parce at longiuscule ciliatum. *Folia* ovali-elliptica, breviter et obtuse acuminata, basi angustata, 4–6 poll. longa, 2–3 poll. lata, membranacea, utrinque viridia, penninervia et eleganter transversim venulosa, axillis venarum subtus sæpe barbellatis, petiolo ½–1-pollicari. *Corymbus* terminalis, fastigiatus, trichotomus, basi foliatus, ramis glabris compressis apice dense dichotome cymiferis. *Bracteæ* ovatæ, membranaceæ, coloratæ (albæ?), fere petaloideæ, 4–5 lin. longæ, per paria connatæ, cymas generales partialesque necnon flores ultimos laterales ante anthesin involventes. *Flores* alares, sessiles, ebracteolati, nunc sessiles, præter bracteas circumvallantes ebracteolati, nunc breviter pedicellati et minute bibracteolati. *Ovarium* dense sericeo-villosum, 2 lin. longum. *Corolla* præter villos faucis glaberrima, tubo 1½ lin. longo, lobis late oblongis tubo paullo longioribus. *Capsula* oblonga, a latere compressiuscula, 4–5 lin. longa, villosa.

Found in the islands at the junction of the rivers Tapajóz and Amazon, by Mr. Spruce, who states it to be a tree of 50 to 70 feet, with a brown polished trunk, the bark being deciduous, as in the Plane-tree. It is often branched from near the base, and known under the Portuguese name of *Pao Mulatto*.

GOMPHOSIA, *Weddell.*

(Trib. *Cinchoneæ.—Aspidanthera,* Benth.)

In vol. iii. of 'Hooker's Journal of Botany' I published, under the name of *Aspidanthera*, a genus which, in the absence of the fruit, I placed among *Rondeletieæ*. This mistake probably prevented Mr. Weddell from recognizing it as identical with his genus *Gomphosia*, described in his splendid as well as excellent monograph of *Cinchona*. As his name is so much better adapted to the genus, as well as shorter than mine, I trust I may be allowed to avail myself of my own inaccu-

racy, and substitute it for that of *Aspidanthera*, notwithstanding the claims of the latter on the ground of priority.

I see nothing to alter in the generic character given by Weddell, nor yet in his account of the species described by him, which must now be increased to three, as follows :—

1. G. *chlorantha*, Wedd. Quinq. p. 96. t. 26. f. B.—I believe I am right in identifying this species with the Roraima specimens gathered by the brothers Schomburgk, and distributed under n. 621 of Sir Robert's second collection, and n. 955 of Richard Schomburgk.

2. G. *longiflora;* foliis ovali- v. oblongo-ellipticis acuminatis basi rotundatis angustatisve submembranaceis utrinque glaberrimis, calycis dentibus 4 triangularibus, corollæ tubo tenui limbo suo triplo longiore.

Apparently common on the Rio Negro, where it forms a shrub or small tree from 8 to 20 feet in height. The corolla is sweet-scented, white, with a greenish tube, and the limb turning at length a brownish-red. It was found both by Schomburgk and Spruce, but in two different states, which I at first considered as distinct species; additional specimens however have induced me to reunite them as mere varieties with the following synonymy :—

a. densiflora.—Aspidanthera rudgeoides, Benth. in Hook. Journ. Bot. vol. iii. p. 217.—On the Rio Negro, *Schomburgk.*

β. laxiflora.— Gomphosia (*Aspidanthera*) *laxiflora*, Benth. in Pl. Spruce exs.—On the Rio Negro, near Barra, and upwards, *Spruce.*

Both varieties differ from *G. chlorantha* in foliage, and especially in the slender tube of the corolla, which is near 9 lines long.

3. G. *Goudotiana*, Wedd. Quinq. p. 97, from New Granada, is unknown to me.

COMMIANTHUS, *Benth.*

(Trib. *Cordiereæ.*)

This beautiful genus has been increased, by the researches of Mr. Spruce, to five species, all agreeing with the original one in its generic character, spicate inflorescence, and gummy exudations, but showing marked differences in foliage, indumentum, size and proportions of flowers, etc. As I now possess them all in flower, as well as in fruit, either ripe or nearly so, I subjoin a detailed character and synopsis of the whole genus.

Char. Gen. COMMIANTHUS. — *Calycis* limbus tubulosus, persistens,

dentibus erectis sæpius brevibus v. obsoletis. *Corolla* hypocraterimorpha, limbi laciniis 5 patentibus æstivatione contorto-imbricatis. *Stamina* fauci inserta, exserta; filamentis sæpius villosis. *Antheræ* lanceolatæ, dorso prope basin affixæ, apice acutæ v. aristato-acuminatæ, basi membrana retusa v. bifida appendiculatæ, loculis longitudinaliter dehiscentibus. *Discus* epigynus carnosus, cupularis. *Ovarium* 5-loculare, ovulis in loculis geminis collateralibus pendulis. *Stylus* filiformis, superne incrassatus, 5-sulcatus, integer v. breviter 5-lobus. *Drupa* globosa, 5-sulca, 5-pyrena; pyrenis crustaceis duris a latere compressis et sæpe angulatis, abortu monospermis. *Semina* oblonga, versus medium affixa, hilo lineari. *Testa* membranacea. *Albumen* carnosulum, album. *Embryo* longitudine fere seminis, linearis, teres; radicula supera; cotyledonibus brevibus ovatis.

Frutices Brasiliæ borealis. *Stipulæ* utrinque solitariæ, persistentes, interdum minutæ. *Spicæ* terminales, simplices, interruptæ, uti flores et gemmæ gummam resinosam exsudantes. *Flores* sessiles, sparsi. *Bracteæ* connatæ in cupulam nunc brevissimam truncatam, nunc membranaceam laciniatam. *Flores* rubri, carnei, v. albi.

1. C. *pilosus*, Spruce; undique piloso-hispidus, stipulis amplis oblongis membranaceis ad medium connatis, foliis obovali-ellipticis, floribus sericeo-villosis.—*Pili* rigiduli totam plantam vestiunt. *Folia* semipedalia, acumine brevi, basi in petiolum longe angustata. *Stipulæ* pollicares, extus villosæ. *Spicæ* 3-pollicares. *Bracteæ* basi connatæ, membranaceæ, inferiores 2–3 lin. longæ et profunde fissæ. *Calycis* limbi tubus 2 lin. longus, dentes fere lineam longi, extus hispidi. *Corolla* intus extusque sericeo-pilosa; tubus 3–3½ lin. longus; limbi laciniæ fere 4 lin. lineari-spathulatæ. *Antheræ* apice longe aristato-acuminatæ, appendice baseos bifida. *Drupa* hispidissima, subglobosa, 4 lin. diametro, 5-sulca, calyce persistente acuminata; pyrenis acute 4-angulis, demum bivalvatim dehiscentibus. *Semen* incurvum.

A small shrub, with flesh-coloured flowers, found by Mr. Spruce in the *Paatingas*, near San Gabriel, on the Rio Negro.

2. C. *Schomburgkii*, Benth. in Hook. Journ. Bot. vol. iii. p. 223; stipulis brevibus triangularibus, foliis margine recurvis supra glabris subtus ramulisque pube brevi exasperatis, corolla sericeo-pubescente. —*Folia* obovali-oblonga v. elliptica, obtussisima v. breviter acuminata, subcoriacea, 2–3 poll. v. rarius fere 4 poll. longa. *Antheræ* brevius acuminatæ quam in *C. piloso*. *Pyrenæ* compressæ, exalatæ, duræ,

post carnem drupæ destructam persistentes, fructum siccum 5-costatum simulant.

In shady campos or savannahs, British Guiana, Rob. Schomburgk, 1st coll. n. 179, 2nd coll. n. 1001, Rich. Schomburgk, n. 1737; near Barra, on the Rio Negro, R. Spruce. I have also seen it in collections from Surinam, and I believe from French Guiana. The flowers are white (more or less spotted with red, according to Schomburgk), scented like those of *Gymnadenia conopsea.* Stamens white, but red at their insertion. Fruit of a deep brown-red.

3. C. *discolor*, Spruce; stipulis brevissimis, foliis ovalibus ramisque glabris, corollæ sericeo-pubescentis tubo calycem glabrum tubulosum 5-dentatum vix duplo excedente.—*Folia* circa 3 poll. longa, $1\frac{1}{2}$–2 poll. lata, coriacea, penninervia et reticulato-venosa, supra nitidula, subtus pallida. *Spicæ* pedunculatæ, foliis longiores. *Flores* sæpius oppositi. *Calyx* glaberrimus, 4–$4\frac{1}{2}$ lin. longus, dentibus brevibus. *Corollæ* tubus 7–8 lin. longus; limbi laciniæ lineares v. subspathulatæ, fere 6 lin. longæ. *Antheræ* acutissimæ sed vix aristatæ, appendicula baseos integra.

On the Rio Negro, in the inundated campos opposite Uananaca, *R. Spruce.* It is a shrub of 7 feet, with handsome flowers of a full red. Leaves, when fresh, of a glaucous-white underneath, which goes off much in drying.

4. C. *speciosus*, Spruce; stipulis abbreviatis, foliis oblongis ramisque glabris, corollæ sericeo-villosæ tubo calycem asperulum minute dentatum subtriplo superante.—*Stipulæ* in cupulam brevissimam truncatam connatæ. *Folia* 6–9 poll. longa, $2\frac{1}{2}$ poll. lata, obtuse acuminata, basi cuneata, coriacea, costa subtus valde prominente, venis subparallelis crebris, venulis reticulatis. *Spicæ* pleræque foliis breviores, floribus sparsis. *Calyx* vix 3 lineas excedens, dentibus minutis. *Corollæ* tubus 8 lin. v. fere 9 lin. longus, limbi laciniæ 5 lin. *Antheræ* brevissime aristatæ, appendice baseos integra. *Pyrenæ* compressæ, obscure angulatæ. *Semina* oblonga, incurva, ventre affixa, albumine parca.

Gathered by Mr. Spruce near San Gabriel, where it formed a shrub of about 8 feet in height, fringing a small sandy campo scarcely 100 feet by 10 in the midst of the forest, bearing a profusion of red flowers down to the very ground, and having at a little distance the aspect of a *Rhododendron.*

5. C. *concolor*, Spruce; glaber, stipulis abbreviatis, foliis obovali-ellipticis acuminatis, spica glabra, floribus pedicellatis, corollæ tubo elongato tenui glabro.—*Frutex*. *Stipulæ* connatæ, truncatæ, cupulatæ, arcte adnatæ, margine subfimbriatæ, lineam longæ. *Folia* semipedalia, 3 poll. lata, apice in acumen angustum obtusum abrupte producta, basi plus minus acutata, petiolo brevi. *Spicæ* (v. potius racemi rigidi spiciformes) foliis breviores. *Flores* crebri, sparsi, pedicello rigido erecto 1–2 lin. longo, apice in cupulam expanso. *Calyx* $1\frac{1}{2}$ lin. longus, limbo truncato vix dentato. *Corollæ* tubus 9 lin. longus; laciniæ 4–5 lin. longæ, extus glabræ, intus leviter cinereo-puberulæ. *Antheræ* appendice lanceolata nec arista terminatæ, membrana baseos retusa vel breviter bifida.

On the borders of an elevated sandy campo near Uananaca on the Rio Negro, *R. Spruce*. A shrub of 9 feet, with long branches often decumbent. Leaves pale green on both sides. Corolla greenish tinged with brown, flesh-coloured inside. Berry globose, scarlet.

In Mr. Spruce's Santarem collection, a species of *Calycophyllum* was by mistake referred to *Macrocnemum*, under the name of *M. subsessile*. It differs chiefly from *C. coccineum* in having the leaves almost sessile and differently shaped at the base, but is perhaps a mere variety of that species.

Psychotria n. 2, of Mr. Spruce's first Barra collection, belongs to *Rudgea*, as defined in the Linnæa, vol. xxiii. p. 455. It is a new species, since again distributed as *Rudgea villosa*; there are two other new species of the same genus in the last collection.

A further examination of Brazilian *Psychotriæ* confirms the sections proposed by me in Oersted's paper on Central American *Rubiaceæ*; but leaves more and more doubtful the line of demarcation between *Pyschotria* and *Cephaelis*.

I there suggested that Achille Richard's *Ronabeæ* with terminal inflorescence, must be *Psychotriæ* of my section *Eupsychotria*; I have since ascertained that Aublet's original *Ronabea* is very different, and identical with *Coffea subsessilis* (Benth. in Hook. Journ. Bot. vol. iii. p. 232, non aliorum); it is certainly no true *Coffea*, and probably stands alone, or nearly alone, as a distinct genus.

Coussarea of Aublet is a true *Faramea*, which genus however does

not include the heterogeneous plants referred to *Coussarea* by subsequent authors, nor yet the whole of the species recently published by Miquel and others as new *Faramea*.

Notice of Two New Ferns *from China; by* Sir W. J. Hooker, D.C.L., F.R.A. and L.S.

(Tab. I. and II.)

Aspidium (Lastrea) podophyllum, *Hook.*

Fronde ovato-lanceolata glabra coriaceo-pergamentacea nitida pinnata, pinnis lanceolatis acuminatis paululum sensim falcatis grosse serratis seu lobato-subpinnatifidis petiolatis, suprema basi subpinnata, venis internis (minime prominulis), venulis 2–3 inferioribus soriferis, involucris orbicularibus sinu angusto, stipite frondem subæquante, rachi costisque (subtus præcipue validis) pallide fuscis. Tab. I.

Hab. China; Hong-Kong, *Major Champion* (n. 560); Chusan, *Dr. Alexander*.

With the caudex of this I am unacquainted. The species seems quite new, at least I fail to find it described in any work. The texture of the frond is rather that of the *Polystichum* than the *Lastrea* group, and in a dry state the involucre has, under a moderate magnifying power, quite the appearance of being entire, orbicular, and peltate: but a more careful inspection will show them to have a narrow and rather deep sinus, where the point of attachment is. In referring this to Aspidium, § Lastrea, I do not mean it to be understood that I consider either "*Aspidium*," Sw., or *Lastrea*, Pr., the proper name for the *genus* of this plant. In the present most confused, and a daily increasingly confused, state of the classification of the Ferns, I think it better in the present case to retain the genus *Aspidium* of Swartz, and refer to the section, or genus if so it be, by which Presl and J. Smith would call it; viz. *Lastrea*. Since the days of Swartz, and of Presl's 'Tentamen Pteridologiæ,' M. Fée has perhaps justly considered *Aspidium Filix-Mas* to be the type of the genus *Aspidium*, while Schott constitutes of it and its allies the genus *Dryopteris;* and *Aspidium*, according to Presl and J. Smith, includes *Aspidium trifoliatum* and other large-fronded species with reticulated veins: but each author has his parti-

cular views of the limits of these genera, as well as of the names they should bear.

TAB. I. *Aspidium* (Lastrea) *podophyllum:—nat. size.* Fig. 1. Portion of a fertile pinna. 2. Sorus:—*magnified.*

BOWRINGIA* INSIGNIS, *Hook.*

Gen. Char. BOWRINGIA, *Hook.* *Sori* ad basin venularum transversalium insidentes, nudi, inter costam et marginem siti, irregulares, magis minusve secus venas decurrentes. *Venæ* internæ, ramosæ; primariæ maculas angulosas costæ parallelas formantes, venulas liberas simplices vel furcatas patentes approximatas fere ad marginem attingentes gerentes.—Filix *arborea,* caudice 2–3-*pedali densissime fibroso-squamoso.* Frondes *sesquipedales, terminales et laterales, glabræ, coriaceo-membranaceæ, pinnatæ.* Pinnæ *patentissimæ vel reflexæ, lato-lineares sed e basi lata sessili sensim acuminatæ argute serratæ.* Costa *subtus prominens.* Venæ *internæ subtus vix elevatæ, fuscescentes, supra depressæ.* Stipes *brevis, basi densissime longissime villoso-squamosus.* Rachis *parce hic illic paleaceo-squamosa.*

Bowringia *insignis.* TAB. II.

HAB. Hong-Kong, *Messrs. Bowring, Major Champion* (n. 294, 295). Khasya hills, Eastern Bengal, *Dr. Hooker.*

We are indebted to the Messrs. Bowring for living plants of this curious and certainly *arborescent* Fern, sent from Hong-Kong, and now growing in the stove of the Royal Gardens at Kew. Major Champion has favoured us with dried specimens of the same with a section of the caudex; and Dr. Hooker has sent home, from Khasya, fronds of the same species, and fine specimens of the trunks three and four feet long. Of our living specimens the terminal fronds died, but lateral ones, from a small knob or projection, have appeared and attained their full size. The fructified specimens appear to be rare in Hong-Kong, but abundant in Khasya.

The affinities of this plant are not easily explained, especially if we consider its arborescent character. The venation and even the habit of

* Named in compliment to Dr. Bowring and his son J. O. Bowring, Esq., members of a family no less distinguished for their love of literature than for their patronage of science whenever opportunity presents itself: and the Messrs. Bowring, above named, have contributed largely to our knowledge of the Natural History of Hong-Kong, and have further been a means of obtaining a correct knowledge of the famous Chinese Rice-paper, and of its mode of preparation.

the fronds are not much unlike *Doodia* and *Woodwardia;* but the venation is more simple: and when the fructifications, as is sometimes the case, are confined to the costal transverse veins, the appearance is that of a *Doodia* with naked sori. But more generally the sori are extended along the lateral veins or veinlets, after the manner of *Gymnogramme,* and we have seen it extend half-way and more up these veinlets in the older specimens, and then we trace an affinity with the *Gymnogramme Japonica,* Desvaux and Kunze (in Schkuhr's Fil. Suppl. p. 39. t. 116),—*Dictyogramme,* Fée, Gen. Fil. p. 170. t. 15 A. f. 2: but there the fructification is all over the veins, and the veins again anastomose between the costal veins and the margin. The whole structure seems such as to entitle it to be considered a new genus.

TAB. II. *Bowringia insignis,* frond:—*nat. size.* Fig. 1. Portion of a sterile pinna, to show the venation. 2. Portion of a fertile pinna seen from beneath:—*magnified.*

Botanical Objects communicated to the Kew Museum, from the AMAZON RIVER, *in* 1851 *and* 1852, *by* RICHARD SPRUCE, ESQ.

(*Continued from* p. 177.)

61. Two wooden spoons, made by Indian fishermen, on the Paranámirí dos Ramos, a branch of the Amazon communicating with the Rio Madeira. The one with the handle-end curved into the semblance of a deer's-foot, is made of a soft white wood, much like Sycamore; it is produced by a small Apocyneous tree, *Plumeria Mulongo,* Benth. This spoon was made with a knife, aided by a rude pair of compasses. The other, carved to resemble a man with a mutilated arm, is made of some wood whose name I could not learn. It did duty in my *cuisine,* under the name of *João,* all the way up the Amazon, without sustaining any injury, save losing a piece out of the brim of the hat by a fall.

62. A piece of wood, from which fire has been drawn by the Indian method. This is used exactly as described in 'Paul and Virginia,' to which may be added, that a notch is cut by the side of the hole in which the pointed stick is twirled round, and a piece of linen rag, or other combustible, placed underneath to receive the sparks which fall down the notch. Any dry and tolerably hard wood will serve for this purpose. The piece now sent seems to be the wood of a Clusiaceous

tree, called *Jacaré-úba*, or the Alligator-tree: it was used by a gentleman of the Barra, on a voyage up the Rio Negro, on an occasion when his tinder having been spoiled by the water, one of his Indians undertook to procure him fire, and succeeded by this method.

63. Milk of the *Cuma-í*, or Sorveira (*Collophora* sp.), the "Cow-tree" of the Rio Negro. The milk is sweet, thinnish, and very viscid; when dry it is more brittle than caoutchouc, which it otherwise much resembles.

64. Fruit and leaves of a small tree, 15 feet high, unbranched, with a crown of large pinnate leaves, and a large terminal panicle.—Forests on the Rio Negro. I have frequently observed this tree, always preserving the same habit, but have only once found its fruit.

65. *Carajurú*, a red dye, prepared from the leaves of *Bignonia Chica*, and used by the Indians of South America for painting their bodies, arrows, etc. It is in this way that the Indians on the Rio Negro make it up for sale. The bag is made from the bark of a large tree called the *Tururí*, in this way:—a piece of a branch is beaten until the bark can be drawn off; this is then tied up at one end, and being turned inside out, forms a bag.—The Uauapé Indians make jackets of this bark in the same way.

66. Cord of *Tucúm* (*Astrocaryum vulgare*, Mart.), and bundles of raw fibre. This "fibre" is merely the leaves of the young shoot of the Tucúm Palm (which, before it bursts forth, is quite colourless), torn up into shreds: it needs no cleansing process of any kind.

66*. A "Couro de Xeringue," or "hide of India-rubber," made on the Paraná-mirí dos Ramos.

67. *Macacarecuya*, or "Monkey's drinking-cup," the fruit of a *Lecythis* (a tree of from 60 to 80 feet), growing in forests near the Barra.

68. Another *Macacarecuya* (and leaves).—By streams near the Barra. Tree, 15 feet by 6 inches, with long weak branches.

69. Capsules only of a *Lecythis*, found under a lofty tree, in forests near the Barra.

70. *Urucurí* (? *Attalea excelsa*, Mart.,—*not* Cocos coronata, *Mart.*, the *Urucurí* of Martius). Three fruits, used on the Ramos in smoking Xeringue.

71. *Guaraná* (*Paullinia sorbilis*, Mart.). Bunch of fruit from Luzéa, on the Rio Mauhé.

72. Cord made by a Múra Indian, of a sipó called *Ituá* (? a Legu-

minous twiner), found near Villa Nova, on the Amazon.—This is sometimes used for bows in lieu of *Curaná*, which it equals in toughness.

73. *Ipadú*, the powdered leaf of *Erythroxylon Coca*, used by Indians on the Rio Negro.

74. *Caiaué* (*Elais melanococca*): spadix, in flower. Rio Janauarí, a tributary of the Rio Negro. Agrees perfectly with Humboldt's description (cited in Kunth, Enum. p. 280), not so well with Martius's.

75. Portion of stem of *Alsophila* sp. Herb. 614. Barra do Rio Negro.

76. *Gravatána*, or Blowing-cane, made by Catauixí Indians, on the Rio dos Purús*. It is a portion of the trunk of the *Paxiuba-í* (a small species of *Iriartea*, very near *I. setigera*, Mart.), 9 feet 3 inches long, wrapped round with the bark of the sipó called *Oambé-címa*. At about 2 feet from the lower extremity is the sight—one or two teeth of the Cutía, stuck on with the resin of the *Jutahí*. The Palm-trunk, of which the Indians make the gravatána, is for the most part split up the middle, to facilitate the scooping out of the soft central portion, the tool used for which is a tooth of the Cutía; the two halves are then re-united by means of the sipó-wrapping. The Indians prefer shooting at an object considerably elevated, the gravatána being difficult to hold in a horizontal position, on account of its weight. When not in use, the gravatána is kept suspended by the middle and by the two extremities, to prevent its becoming crooked. Should it unfortunately acquire a curve, by being steeped in water a short time it admits of being straightened.

77. Quiver (called *Marupá*) belonging to the above, and containing poisoned arrows. The *Marupá* is in the form of a truncated cone, the lower diameter being nearly 4 inches, the upper 3 inches, and the length 11 or 12 inches; it is made of the sipó *Oambé-címa* (the wood, not the bark), and thickly smeared with the resin of the *Jutahí* (*Hymenæa* sp.). The arrows are about a foot long, and the thickness of the stoutest knitting-needles; they are made of the nerves of the sheathing-base of the petioles of the *Pataná*, which, remaining when the parenchyma decays, form a sort of beard on the trunk. They are called by the Catauixí Indians *Araráicohí*, and the poison with which they are smeared *Arinulihá* (in Lingoa Geral, *Uirarí*). It is customary to make them up into bundles such as I send you. When the Indian

* About the 7th degree of south latitude.

goes a-hunting, he takes out as many arrows as he is likely to want, anoints the points with *Uirarí*, and wraps the lower end with *Samaüma*-cotton to the thickness of the bore of the *gravatána*.

Attached to the *Marupá* is a slender tube of tabóca or bamboo, 2½ inches long, containing soot, which the Indian applies to his face by means of a piece of cotton, when he approaches his house, after being successful in the chase; by this means his family are beforehand advertised whether or not they are to go without supper.

78. Twelve arrows (*Curabí*) and a quiver made by Catauixí Indians. The shaft is the flower-stalk of a large grass (*Gynerium saccharoides*, H. B. K); the head, which is about 17 inches long, is of Paxiúba (*Iriartea exorrhiza*, Mart.). The wrapping is cotton, coloured red with *Carujurú*, with the addition of strips of split quill at the base of the head. The feathers are chiefly those of a sort of hawk and of a white heron. These arrows are such as they use in their wars with the neighbouring tribes, and are all poisoned with Uirarí. The quiver is merely a piece of bamboo.

79. Seven arrows and a quiver made by Indians up the Rio Negro. Shaft of *Gynerium saccharoides;* head of Paxiúba; the feathers which ornament it are of a species of *Toucán;* the wrapping for one inch above the feathers is of the skin of some monkey, cut into slender strips; then follows the same length of cotton wrapping, and lastly half an inch wrapped with a shining tough fibre, said to be prepared from the bark of some tree; this reaches to the poisoned part of the head, which is notched round in several places, with the intention of its breaking off in the wound. Quiver of leaves of Bacába (*Œnocarpus disticha*, Mart.); wrapping of monkey-skin and cotton. There is, inside, a separate tube of Bacaba-leaf for each arrow. Bow of Pao d'Arco (*Tecoma*, sp.); string of Curaná (*Bromelia Karatas*).

80. *Bauná*, Ling. dos Purús = *Maihão*, Ling. dos Múras = *Maniacea-açu*, Ling. Ger.: two roots; farinha and tapioca prepared from root. Leaves. The plant (a woody twiner) grows in forests on the Rio Janauarí and elsewhere near the Barra do Rio Negro.—For further account see letter (given at p. 207 of this volume: see p. 210).

80*. *Bauná-rána.* Leaves only.

81. Specimens of woods:—

Herb. n. 1120. *Euphorbiaceæ*. Portion of branch.

1141. ? Branch.

n. 1168. ? Branch.
1173. *Myristicaceæ.* Trunk.
1187. *Lauraceæ.* Branch.
1251. *Menispermeæ.* Trunk (sipó).
1285. *Malpighiaceæ.* Branch (hard).
1286. *Id.* Branch (soft).
1301. *Anonaceæ.* Trunk.
1319. *Amyrideæ.* Trunk (resinous).
1320. *Rubiaceæ.* Trunk.
1322. *Artocarpeæ.* Trunk.
1333. ? Branch (gummy).
1343. *Myristicaceæ.* Trunk.
1341. *Myrtaceæ.* Trunk.
1344. *Amyrideæ.* Trunk (resinous)
1345. *Rhizoboleæ.* Branch.
1347. *Solaneæ.* Trunk.
1393. *Clusiaceæ.* Trunk (of small tree) and bark.
81 *a.* *Menispermeæ.* Sipó (wood dark red, zoned, exuding gelatinous juice).
81 *b.* *Rhizoboleæ.* Piranha-úba: squared block and leaves.
81 *c.* *Cecropieæ.* Trunk and leaves.

81. Fruits in spirits:—
Piquiá-rana (*Caryocar*, sp.). Herb. 1345. Edible.
Jerubéba (*Solanum*, sp.). Herb. 1347.
Ymurá-ceém (*Clusiacea*). Herb. 1393. (Small fruits in linen.) Edible.
Umarí (*Chrysobalanea*). Fruit (and leaves). Edible.
Guyába (*Psidium*, sp.). (In linen.) Edible.
Popunha (*Guilielma speciosa*, Mart.). Branches of spadix with fruit (to be carefully taken out). Edible.
Cubíu (*Solanum*, sp.). Fruit ovate, red; makes the best "*doce*" of any fruit on the Amazon. Edible.

83. *Maximiliana Inajaï*, sp. n.—*Inajá-í*, Ling. Ger. Trunk, frond, spathe. 12–20 feet high.

84.? *Leopoldinia pulchra*, Mart.—*Jará*, L. G. Stem, two fronds. ♀ and ♂ spadices in flower (*dioic.*). Ripe fruits. Grows 8–15 feet high. Agrees with *Leopoldinia pulchra*, save that it is *uniformly dioicous.* Fruit when ripe dull red.

85. *Geonoma* (*G. pauciflorœ*, Mart., aff.). Entire plant, in fruit.

86. *Iriartea pruriens*, sp. n. (*I. setigeræ*, Mart., aff.)—*Paxiuba-í*, L. G. Entire plant, in fruit.—Of this the gravatánas are made. *Fruit vermilion.*

87. *Œnocarpus Batana*, Mart. (*Pataná*, L. G.) A few pinnæ; branches of spadix; fruits. 60–80 feet high. *Fruit purplish-primrose.*

88.? *Hyospathe.* (*Ubím-rána*, L. G.) Entire plant, in fruit.

89. *Œnocarpus minor*, Mart. (*Bacaba-í*, L. G.) Apex of trunk; one frond; two spadices. 15–30 feet high. Fruit blackish-purple.

90. *Euterpe mollissima*, sp. n. (*Assaí-mirí*, L. G.) Portions of base and apex of trunk; one frond. Grows 30 feet high, and tapers considerably. Pinnæ *horizontal*, not secund as in the other species. Only decayed spadices hitherto observed.

91. *Bactris bidentula*, sp. n. (*Marajá*, L. G.) (This is a general name for all the *Bactrides.*) Portion of stem; two fronds; spathes, spadices, and fruit. Grows 10–15 feet high. Fruit nearly black, very juicy, and intensely acid.

92. *Bactris concinna*, Mart. Portion of stem; three fronds; spathes, spadices, and fruit. Grows 10–14 feet high; generally decumbent or arcuate. Fruit black, shining, sweet. ! Pinnæ remarkable for bluish metallic lustre on underside.

93. *Bactris rostrata*, sp. n. Entire plant, in fruit. Fruit vermilion.

94. *Geonoma ochreata*, sp. n. Entire plant, in fruit.

95. *Geonoma tuberculata*, sp. n. Upper half of stem, in fruit.

96. *Pepino do mato.* Leaves. Fruit in spirit (this and the following will come with the next envoy).

97. *Cupua-í.* Leaves. Fruit in spirits.

98. *Smilax* sp.—*Salsaparilha*, Port. Stem (twining round a myrtle-branch) and leaves.

99. *Sipó do Jabotím*, L. G., or the "Land-turtle's ladder."—This is the general name of the stems of the twining *Bauhinieæ.* The example sent is probably a species of *Caulotretus.*

100. Guitar of bamboo, made and used by Indians on the Paraná-mirí dos Ramos.

101. Hat made of the leaf of the *Tucumá* (*Astrocaryum Tucuma*, Mart.)

102. Five brooms of *Piassába*, made by Indians on the Rio Negro. Two of these are wrapped at the end with the *Piassába* itself: these

take the most making, and are accounted the strongest; one is wrapped with *Timbó-titíca* (*Menispermacea*); one with *Jacitára* (the stem of a twining prickly Palm, probably *Desmoncus polyacanthos*), and one with *Uarumá* (*Calathea* sp.).—The largest requires a handle, the others are used without handles.

103. Mat made at Moyobamba in the Peruvian Andes, of the young fronds of the *Muritî* Palm (*Mauritia* sp.).—These mats serve during the day for a dining-table, and at night, spread under the hammock, for a carpet.

104. *Maqueira* (hammock) made by Indians on the Rio Napo, of the young fronds of the *Tucúm* Palm (*Astrocaryum vulgare*, Mart.).

Maqueira cord is all spun by hand, without distaff. The Indian woman holds the fibre tight with her left hand, and with her right rolls it along her thigh. This explains why nearly all the women met with on the Solimões have a callosity on the upper side of the right thigh.

105. *Maqueira* of Tucúm, made by Tucúna Indians, inhabiting the north shore of the Solimões, about the 70th degree of west longitude.

106. "Contas," used by the Indians of Nauta (near the mouth of the Ucayali) in their dances. They seem to be the cotyledons of some Lauraceous fruit, and are slightly odoriferous.

107. Two rings of kernel of *Tucumá* Palm (*Astrocaryum Tucuma*, Mart.). Barra do Rio Negro.

108. *Lepidocaryum* sp. (*L. tenui*, Mart., aff.) Portion of ♀ plant in fruit, and of ♂ plant in flower. Forests at the back of the Barra do Rio Negro, on ascending dry ground. July, 1851. Gregarious; stems 8–12 feet high. Fruit: scales yellowish, brownish in centre, nearly black at the apex. Seems to differ from *L. tenue* in the tristichous leaves and cuspidate fruit. I have called it *L. tristichum* in my MSS., but you will perhaps be so kind as to consult Martius's figure of *L. tenue*.

109. *Bactris bifida*. *Bussú-rána*, L. G. Forests in angle between Rio Negro and Solimões. May, 1851. Stem 10 feet by 1 inch, generally leaning. Fruit green-and-deep-purple. Mesocarp juicy, subacid. (Leaves, fruit, and portion of stem.) A very handsome Palm!

110. *Bactris concinna*, Mart.? Inundated spots at the mouth of the Rio Negro; growing in tufts. August, 1851. (Flowers and persistent fruit, leaves, etc.) I think you will find this the same as the '*Bactris concinna*' previously sent, though the habit was rather different. The flowers are yellow.

111. *Elais melanococca*, Gaertn. *Caiané*, L. G. Forests at the mouth of the Rio Negro. August, 1851. (Spadix with fruits.) Stem scarcely any, rarely erect. Fruits scarlet. The name '*melanococca*' is very inappropriate.

112. *Iriartea exorrhiza*, Mart. Marshes in forests on the Rio Negro. (Spadix and fruit, better than formerly sent.)

113. *Euterpe* sp. *Assaí do Rio Negro.* (Spadix with fruit; portion of trunk; portion of frond.) Moist forest in the angle between the Solimões and the Rio Negro, abundant. May, 1851. Trunk 81 feet from base to insertion of fronds. Fronds 8 feet 6 inches; pinnæ 2 feet 6 inches, about seventy-eight pairs. Fruit black, $\frac{7}{16}$–$\frac{1}{2}$ inch diameter.

The *Assaí do Pará* differs from this in its smaller size; the trunk rarely reaching 30 feet, generally leaning, and so slender that it will only bear the weight of children, while on this of the Rio Negro men climb to the very summit; and in the decidedly *larger and glaucous fruit.* I think there is too considerable difference in the fronds, but without specimens of the Pará plant I cannot state it accurately.

Note.—I called the Pará plant *Euterpe edulis*, but it requires to be re-examined, as I had no other authority than the names in the collection at Kew. If it be really *E. edulis*, then the Rio Negro *Assaí* is assuredly not *E. oleracea;* for the latter is said to have a *larger* fruit than the former. May not the heights of these Euterpes have been exaggerated? (*Vide* Kunth, Syn. 178.)

114. *Cocura dulcis*, MSS. Herb. 1219. Sapopema and portion of stem (about first branch).

115. Wasp's nest from the Rio Solimões. The materials of this are entirely *vegetable*, though man was not the architect; and it is so pretty that I think you will like to have it.

116. Pod of the *Ingá-açú* (or Great Ingá). Herb. 1651. Rio Solimões. June, 1851. Pulp copious, very sweet. The sides of the pod have collapsed considerably in drying. This is the largest and handsomest of all the Ingás. My flowering specimens were gathered from a tree 40 feet high by 2 feet thick. The flowers are white, in globular heads about the size of a cherry, and scattered over the tree in such profusion that they only allow the young leaves, of the most delicate pink, to appear here and there; they have besides a delicious odour of cinnamon, with which the shores of the Solimões are quite

perfumed in the months of July and August, when the *Ingá-açú* is in flower.

121. *Iriartea pruriens*, MSS. Flowers (with stem and leaves) of the Blowing-cane Palm; not very good, but the only flowering specimen I have seen.

117. Fruits and leaves of *Eriodendron* sp.; an *E. Samaüma*, Mart.? On high ground near the Rio Manaquiry, a small tributary of the Solimões. The white cotton of these fruits is what is called "*Samaúma,*" throughout the Amazon; but I was surprised to find that the tree producing it is a totally different species from the large "*Samaúma do gapó,*" of the trunk of which I lately sent you a sketch. The *Samaúma-tinga* (white-cotton tree) rarely exceeds 60 feet in height by 2 feet in diameter; it has no 'sapopemas,' and the trunk is aculeate to the very base. The *Samaúma do gapó* is said to yield a brownish cotton; and there is a third species of *Eriodendron,* of the "terra firme," also an immense tree, said to yield a yellowish cotton. Which of these three is the *Eriodendron Samaüma* of Martius?

118. Fruit of the *Guaraná* of the Rio Negro; possibly distinct from that of the Mauhés. I have not seen the leaves.

119. Fruit of a Mimoseous tree called *Paricá.* By the Rio Janauarí, which runs into the mouth of the Rio Negro; also throughout the Solimões and its tributaries. Tree 50 feet by 2 feet; bark muricated; flowers white.

The seeds are roasted and ground in the same way as coffee, and the powder taken as snuff or in a clyster. It is used chiefly by Indians dwelling southward of the Solimões, especially by the Múras, Purupurús, and Cataüixís, and all seem to have the same mode of taking it. The bone of a bird's leg is cut across, and the two pieces joined with cotton-wrapping at such an angle that, one end being placed in the mouth, the other reaches the nostrils; a portion of *Paricá* is then put into the tube, and one end being applied to the mouth, the *Paricá* is blown from the other end with great force up the nose. The clyster-pipe is made on the same principle, of the long leg-bone of the Tuyuyú (*Mycteria Americana*). The effect of *Paricá* taken as snuff is to speedily induce a sort of intoxication, resembling in its symptoms that produced by *Amanita muscaria.* Taken as a clyster it is a purge, more or less violent according to the quantity employed. When the Cataüixí is about to set forth a-hunting, he takes a small clyster of *Paricá,* and

administers another to his dog, the effects on both being (it is said) to clear their vision and render them more alert.

120. *Oambé-címa*, the tough pendulous roots of an Aroideous epiphyte (together with leaves and fruit). Inundated forest in the angle between the Rio Negro and Solimões. The bark and wood of this are equally strong, and are used either separately or in conjunction. For wrapping gravatanas, or blowing-canes, the bark alone is used. For tying up salsaparilha, the sipó, with the bark on, is used either entire or split up the middle. The only limit to the length of the roots is the height of the trees on which the plants grow, for when perfect they always reach the earth or water, hanging down like so many bell-ropes. *The bark is distinctly and easily separable.* The stem of the plant is succulent and brittle, like that of most Aroideæ.

There is another Aroideous sipó, called *Oambé-curúa*, used as cordage; this has a spinulose bark. Both these sipós have an acrid juice, which raises blisters on the hands of those who gather them.

(*To be continued.*)

BOTANICAL INFORMATION.

Dr. Wight's Return to England.

With the arrival of its indefatigable author, we have to acknowledge the receipt of the concluding part of one of the most valuable contributions to Botanical science that has ever appeared in any country, namely the 'Icones Plantarum Indiæ Orientalis.' This work has repeatedly been alluded to by us, and always in terms of high commendation; but well as it was begun and carried on, its most sanguine admirers amongst Botanists never contemplated the excellence which it has latterly attained. In respect of pictorial illustration, the last part rivals all its predecessors, whilst in typography it is greatly superior to any. Considering the immense disadvantages under which printing is conducted in India, this is some praise; for we must not shut our eyes to the fact, that the Indian press is unparalleled for the amount of errors with which it has disfigured most scientific works that have emanated

from it. In the case of the 'Icones Plantarum Indiæ Orientalis,' this is to be accounted for to a great extent by the fact, that the author and printer were severed by many hundred miles of mountains and jungles, and that the penny postage is still only a probability in India. That the printing therefore has improved in like manner with the engravings is but another proof of the surpassing perseverance of the author, who is not only the director of the artists, but of the lithographic press, and to whose exertions both the establishment and improvement of the art of botanical drawing on stone in the peninsula of India is wholly due. In the preface to the last part, the author's own avowal of the imperfections of his work shows the singular candour and modesty with which a man of such energy, and one who has attained such great eminence in Botanical science, surveys the fruits of thirteen years' unremitting, well-directed labours, and a work of which any one may be proud to be called the author. It is with peculiar pride that we call attention to these facts, for it was in our own plant-rooms at Glasgow that the scheme of illustrating Indian plants in India was matured, now nearly twenty years ago, by Dr. Wight, when with characteristic energy he visited the lithographic establishments in Glasgow, made himself thoroughly acquainted with the machinery, tools, and manipulations, purchased at large expense, from his own resources, the necessary materials, and took them out to India. His first letters thence recorded disappointments and discouragements under which any other person would have succumbed, but always ended with further evidence of his indomitable perseverance, and of his hopes being unclouded still; and when, after innumerable failures, from the damp and heat of the climate, clumsiness and prejudice of the natives, warpings of presses, breaking of stones, moulding of paper, drying of printing-ink, and cracking of rollers, he at last produced a few recognizable plates of Indian plants, they were forwarded first of all to Scotland, and received more as proofs of what man may do under whatever difficulties, than as the earnest they really were of the volumes now lying before us. For our own part, we cannot join in a wish that the author has expressed to us, that the early plates of this work, or of the 'Illustrations of the Genera of Indian Plants,' should be cancelled: they are most interesting records of the difficulties he overcame, and an example to all future labourers in the same field.

Dr. Wight is about to establish himself near Kew, and devote him-

self still to Indian Botany, distributing his ample Herbarium, and continuing the 'Prodromus Floræ Peninsulæ Orientalis.' With the advantages he will hereafter enjoy, this work will, we have no doubt, be marked by accurate and sound views of structure, system, and nomenclature. Indeed, despite all the drawbacks which he enumerates as having pressed heavily on him in India, in the shape of deficient libraries, etc., his works show a singular, and, we say with regret, a very rare love of truth, and earnest desire to reduce species to their proper limits and their proper names. This singleness of purpose is the more admirable in a naturalist having every facility and every excuse for magnifying the importance of his own researches, and describing all supposed discoveries as new. Dr. Wight herein stands out in bold and singular contrast to the host of botanical authors now obscuring the pages of our periodicals with a cloud of synonymy.

To the general usefulness of all Dr. Wight's works there is but one drawback, namely, a want of attention to style and composition. Now that botanists have so much, and often useless, matter to wade through before arriving at a result in any department of their science, it is particularly incumbent on authors to study terseness of expression, to avoid all verbosity and alliteration, to arrange discursive matter well, and to prune it of as many words as possible. The writings of Brown and Lindley are models in this respect, ever before the English botanist's eyes,—ever approved of, but seldom imitated.

Botanical News from Italy. (From the 'Bonplandia.')

Florence, June 17, 1853.

I did not write to you in May because I had nothing to communicate. I anticipated it would have been the same this month, but, contrary to expectation, several recent publications have just reached me, of which I will now proceed to give a brief summary. I shall begin with two memoirs by Professor Moretti, of Pavia; the one is his eighth memoir in defence and illustration of Mattiolo's botanical works; in which, continuing to investigate the subject of representation of plants in wood-cuts, he treats of those belonging to the 16th century, and through his erudite researches brings to light several new and interesting facts. The other is an historical and critical account of *Dantia*

(Isnardia) *palustris*, written principally with the view of vindicating the generic name of that plant given to it in 1710 by Francis Petit, who first constituted it a separate genus.

M. Barbieri has published the description of a new species of *Vallisneria* (*V. pusilla*), which he found near Pavia.

The first number of the ninth volume of Professor Bertoloni's 'Flora Italica' has made its appearance. It contains the remainder of *Carduaceæ*, together with those genera of *Eupatoriaceæ*, *Asteroideæ*, and *Senecionideæ*, distributed in the classes *Syngenesia polygamia æqualia* and *Syngenesia polygamia superflua* of the Linnæan system, followed by the author. The first genus described is *Cnicus*, of which alone thirty-one species are enumerated; at this one must not be surprised, considering that it is made to include *Cirsium*, *Picnomon*, *Chamæpeuce* and *Notobasis* of modern botanists; the author even considers it as only artificially separated from *Carduus* by the character of *pappus plumosus*. Then follow *Onopordum*, *Cynara*, *Carlina*, *Atractylis*, *Acarna* (*Atractylis cancellata*, L.), *Kentrophyllum*, *Carduncellus*, *Bidens*, *Adenostylis*, *Eupatorium*, *Stæhelina*, *Chryzocoma* (including *Linosyris*), *Santolina*, *Diotis*, *Lonas*, *Orsina*, Bert. in Ann. Sc. Nat. non DC. (*O. camphorata*, Bert., *Jasonia glutinosa*, Guss. non alior.), *Balsamita*, Desf., *Tanacetum* and *Artemisia*. There is little or nothing new as regards the species of *Tanacetum;* not so with the last genus *Artemisia*, in which we find *A. pedemontana*, Balb., and *A. nitida*, Bert., separated from *A. lanata*, and most of the species accompanied by an elaborate synonymy.

We have received a circular addressed by M. Ettore Celi to all Italian botanists, informing them of the formation of a public herbarium in Modena, under the name of "Reale Erbario Atestino," of which he is named the director, and inviting them to exchange specimens of plants with the Modena Herbarium. At the end of each year he is going to publish a catalogue of specimens ready for distribution, and send it to all those who ask for it.

The report on the disease of the vine, by the commission appointed by the Accademia dei Georgofili of Florence for that purpose, is now printing. As soon as I have obtained a copy I shall not fail to give you an abstract of it, with all the details the subject deserves. I am sorry to be obliged to add, that during the last few days symptoms of the disease have again manifested themselves in some parts of this place, as well as in the environs of Pisa, and generally in all flat parts of

the country. A disease of the wheat has made its appearance: it seems owing to (or at least contemporary with the existence of) a fungus of the genus *Torula*.

Mr. Webb departed on Saturday last for Paris. He made a much shorter stay at Florence than we expected, and on that account did not, as was anticipated, pursue his labours with Parlatore in the "Florula Æthiopico-ægyptiaca."

I grieve to say Professor Parlatore's health is not quite satisfactory; he has not yet entirely recovered from the severe trial to which his constitution was subjected in Lapland, and he has moreover been weakened by excessive study during this spring. The physicians have recommended him moderation in intellectual labour, bodily exercise, and change of air.

The deaths among botanists have been unusually numerous of late.

M. Adrien de Jussieu.

"*Paris, July* 5.—It is my painful duty to announce the death of M. Adrien de Jussieu. Although M. de Jussieu's bodily constitution did not lead me to expect that the illustrious *savant* would enjoy a long life, yet his decease was not the less felt by all. Last Friday, July 1, his numerous friends and pupils attended his funeral. M. Fortoul, Minister of Public Instruction, was present at the ceremony. Sweden was represented by the great Algologist, M. Agardh, who happened to be here. M. Brongniart paid the deceased the last honour, in the name of the Institute; M. Duméril, who was already member of the Institute when Jussieu was a boy, in the name of the Museum; M. Milne-Edwards, in the name of the Faculté des Sciences; and M. Decaisne, in the name of the Société Agricole. The same gentlemen, in giving brief sketches of Jussieu's life, dwelt upon the eminent services which he rendered to science. M. A. de Jussieu died on the 29th of June, 1853, aged fifty-six years. He leaves no male heirs, so that the family, which, during more than a century, has been the ornament of science, will become extinct with him. His mother, who is eighty years old, and at this advanced age is still able to discharge all her domestic duties, has to mourn the loss of this her only son."—*Bonplandia, July* 15, 1853.

Dr. and Professor Walpers.

This laborious botanist, best known by his 'Repertorium Botanicon' and 'Annales Botanicæ,' useful compilations destined to record all plants recently published, is said to have died by his own hands in Germany; and even to have written a letter previously to the event, to Reichenbach and other friends, to inform them that he was dissatisfied with the world, who would not recognize his merits, and place him in a position to which he considered himself entitled, and was therefore going to destroy himself. Dr. Petermann, of Leipzig, it is understood, will probably continue the 'Annales,' or carry on some work of the kind.

John Carne Bidwill, Esq.

We have with great regret to record the death of this amiable gentleman, son of Jas. G. Bidwill, Esq., merchant, of Exeter; a distinguished and successful scientific cultivator, botanist, and traveller. For many years he has communicated to our Gardens and our Herbaria numerous rare plants of New Zealand and Australia. Latterly he was appointed Commissioner of Crown Lands at the Wide Bay district, Australia, where his duties were not a little onerous, but where he nevertheless found time to gratify his taste for botany and zoology. From North-east Australia he introduced to our Gardens living plants of the Bunnya-Bunnya (*Araucaria Bidwilli*, Hook.), and roots of the magnificent *Nymphæa gigantea*, Hook. Between two and three years since, while laying out a new road between the district of Wide Bay and that of Moreton Bay he was separated, without a compass, from his party, and was eight days in the bush without food, cutting his way with a small pocket-hook through the parasitical entanglements of the scrub. The exertion superinduced inflammation of the kidney, of which he eventually died (March 1st, at Tinana, in his thirty-eighth year), after protracted and most acutely painful suffering. He was Chairman of the Bench of Magistrates of the Wide Bay district, and in every relation of life was much endeared to a large circle of friends in Europe and in Australia.

Specimens of Australian Algæ.

Dr. Harvey, of Trinity College, Dublin, being about to visit Australia, under the joint auspices of the University and of the Royal Dublin

Society, for the purpose of exploring the natural history of the southern coasts of that continent, has made arrangements for extensively collecting *Marine Algæ*, a portion of which (not required for the University Herbarium) will be offered for sale.

The Australian shores are well known to be rich in varied and curious forms of Algæ. Among the *Olive-coloured* Algæ, many of the most remarkable *Fucoids* are either peculiar to those shores, or there assume their most remarkable development. The Fucaceous genera *Sarcophycus*, *Myriodesma*, *Carpoglossum*, *Landsburgia*, *Hormosira*, *Notheia*, *Cystophora*, *Scaberia*, *Marginaria*, *Scytothalia*, *Seirococcus*, and *Carpophyllum* are peculiar to New Holland and New Zealand. Among Laminarieæ several *Eckloniæ*, and among Sporochnoideæ some remarkable *Sporochni* and *Carpomitræ* occur. Of the other Orders of the olive series there are also several beautiful forms, though less characteristically peculiar than those just named.

Among Rhodosperms, the remarkable forms are much too many to enumerate. Here occur the most beautiful of the *net-work* Algæ, as *Claudea*, *Thuretia*, *Hanowia*, *Halophlegma*, etc. The genera *Amansia*, *Pollexfenia*, *Dictymenia*, *Epineuron*, *Lenormandia*, *Jeannerettia*, *Polyphacum*, *Polyzonia*, are among the most interesting Rhodomelieæ; while numerous beautiful species of *Dasya* and *Polysiphonia* complete that Order. Among Laurenceiaceæ, the exquisite *Delisiæ*, with *Asparagopsis*, *Ptilonia*, *Champia*, and numerous *Laurenciæ*, are found. Of Sphærococcoideæ, many beautiful *Delesseriæ* and *Nitophylla*, *Hemineura*, *Thysanocladia*, *Dicranema*, *Sarcodia*, *Melanthalia*, *Eucheuma*, *Phacelocarpus*, etc. Several fine *Wrangeliæ; Gelidium*, *Pterocladia; Apophlœa*, *Curdiea; many superb *Plocamia; Stenogramma*, *Rhodophyllis*, *Areschougia*, *Rhabdonia;* several beautiful *Callithamnia*, *Ceramia*, *Griffithsiæ*, and *Ptilotæ; Ballia*, *Dasyphila*, *Ptilocladia*, etc., are included in the extensive catalogue.

Among *Chlorosperms*, numerous and very curious *Caulerpæ*, and several genera of *Siphoneæ*, with the usual proportion of Confervaceæ, may be noticed.

As yet the Australian Coasts have been very imperfectly explored: —naturalists and collectors who have hitherto visited Australia having chiefly attended to other departments, and but cursorily collected and often carelessly preserved the Marine Algæ. While Dr. Harvey's duties will comprise the collection of all marine productions, his *atten-*

tion will be more particularly fixed on the Algæ, among which, therefore, it is hoped he will reap an abundant harvest of new and beautiful forms, particularly among the more delicate and perishable kinds. The specimens will be all collected and carefully preserved either by himself or under his immediate oversight, with as much attention to neatness in displaying them as circumstances will admit. The filiform kinds will be displayed on white paper.

Dr. Harvey's first collections will be made in Western Australia, at various points along the coast from Swan River to King George's Sound. Three or four months will be devoted to this locality, from which it is intended to ship for England about *March*, 1854, the collections that shall have been made there. Dr. Harvey will then proceed (perhaps touching for a short time at Adelaide) to Sydney and Van Diemen's Land, from which a second shipment may be expected to be made about *December*, 1854; but no distribution of the collections will take place till Dr. Harvey's return to Europe in 1855.

It is impossible at present to state the number of *species* which may be offered for sale. The number of subscription *sets* will be limited, *at the most*, to 50:—which will probably be of very unequal extent, the larger sets containing possibly 400 to 600 species, the smaller 200 to 300. Subscribers who desire full *suites* will be entered for them in the order in which their names are received, the earlier consequently being entitled to the most numerous and valuable sets. The subscription will be at the rate of £2. 5*s*. per 100 species; delivered, free of all charges for freight, commission, etc., either in Dublin, London, or Glasgow, as desired; and, to accommodate persons who do not wish for more than a sample of the Australian marine vegetation, small sets of 100 or 200 species, at the same rate, will be selected from the duplicates which may remain after supplying the general subscribers. The specimens will be *numbered*, and printed lists of numbers, with the habitat and a provisional name, will be furnished with the sets; these provisional names being subject to revision and correction, when time shall allow of the preparation and publication of a full synoptic table, which will then be distributed to subscribers.

NOTICES OF BOOKS.

Palm Trees of the Amazon, and their Uses, by Alfred R. Wallace.

This little work, now preparing for the press, will contain figures of forty-three species of Palms, with descriptions of their several peculiarities of growth, size, and colour, of the localities and soils which they prefer, and a full account of the various uses to which they are applied. An outline of the botanical characters, and of the geographical distribution (illustrated by maps) of the whole family will also be given. The number of Palms is so great, they are of such importance to the inhabitants of the countries in which they grow, their forms are so elegant and varied, and so little is popularly known of them, that the author is induced to bring before the public his notes and sketches made during a four years' residence in the richest Palm country in the world, with the hope that they may prove interesting and useful. The drawings were all made from trees growing in their native forests, and the localities they inhabit, as well as the uses to which they are applied, were in every case determined by personal observation. The plates will be lithographed by Mr. Fitch, the botanical artist, and the characteristic features of every species will be carefully preserved.

ARCHER, THOMAS C.: *Popular Economic Botany, or description of the botanical and commercial characters of the principal articles of Vegetable origin, used for food, clothing, tanning, dyeing, building, medicine, perfumery, etc.* Reeve and Co.

A most useful and interesting book, with plates worthy of all praise; but we must reserve a more particular notice for another occasion.

Schlechtendahl's 'Linnæa.'

We learn with much regret that this important German botanical periodical, of which twenty-five volumes have appeared, is likely to be brought to a close with the twenty-fifth volume.

Dr. Bromfield's Flora of the Isle of Wight.

It is well known among British botanists that the late lamented Dr. Bromfield had left a nearly complete MS. Flora of the Isle of Wight, together with a botanico-geographical map, prepared and engraved expressly for this work. We are happy to be able to announce that these will soon be prepared for publication by Mr. Pamplin, and that Dr. Bell Salter has undertaken to make the needful alterations and additions, and conduct the work through the press.

Seaweed Collector's Guide; containing plain instructions for collecting and preserving, and a list of all the known species and localities in Great Britain; by J. Cocks, M.D., of Devonport.

Mr. Van Voorst has announced a work with the above title, which, from the known character of the author, cannot fail to be useful to those who desire to preserve specimens of the most delicate and beautiful of Nature's vegetable products of the British coasts.

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1. H. Falconer, M.D., F.R.S., Superintendent of the Honourable Company's Botanical Gardens, Calcutta: *Report on Teak Forests of the Tenasserim Provinces; with other papers on the Teak forests of India.* Royal 8vo. Calcutta, 1852. Maps and two botanical plates.
2. A. Gibson, Superintendent, Botanical Gardens, Bombay: *Report on Teak and other Plantations and Forests in the Bombay Presidency;* forming Vol. I. for 1852 of the Transactions of the Agri-Horticultural Society of Bombay. 8vo. Bombay, 1852.

Two works of the highest importance to those who feel an interest in the preservation of the Teak forests in India for the supply of naval timber, but which have been hitherto destroyed in the most reckless manner imaginable. No gentlemen could be more competent for the task here fulfilled, whether their scientific attainments or general knowledge be considered, than Drs. Falconer and Gibson.

Catalogue of Mr. Geyer's *Collection of Plants gathered in the* Upper Missouri, *the* Oregon Territory, *and the intervening portion of the Rocky Mountains; by* Sir W. J. Hooker, D.C.L., F.R.A. *and* L.S.

(*Continued from* vol. iii. p. 300.)

Scrophularineæ, *Juss.* (continued.)

1. Mimulus *floribundus*, Lindl. Bot. Reg. t. 1025.—Hook. Fl. Bor. Am. vol. ii. p. 99.

Hab. Muddy borders of ponds, valley of Kooskooskie. July. *n.* 474.

2. Mimulus *Jamesii*, Torr. et Gr.—Benth. in De Cand. Prodr. vol. x. p. 371.

Hab. About a spring between Great Sandy and Kansas Rivers. May. *n.* 131.

3. Mimulus *guttatus*, De Cand.—Hook. Fl. Bor. Am. vol. ii. p. 99.

Hab. Springy places, slope of a hill near Kooskooskie River. May. *n.* 347.

1. Gratiola *Virginica*, L.—Hook. Fl. Bor. Am. vol. ii. p. 100.

Hab. Exsiccated ponds in the plains of Upper Missouri and Oregon territories. July, August. *n.* 442.

1. Veronica *serpyllifolia*, L.—Hook. Fl. Bor. Am. vol. ii. p. 101.

Hab. Rivulets in the high plains of the Nez Percez highlands. *n.* 649.

2. Veronica *Beccabunga*, L.—Hook. Fl. Bor. Am. vol. ii. p. 101.

Hab. Mountain rivulets, Nez Percez country. *n.* 671.

3. Veronica *scutellata*, L.—Hook. Fl. Bor. Am. vol. ii. p. 101.

Hab. Around pools; valley of Upper Clarke River. *n.* 184.

4. Veronica *peregrina*, L.—Hook. Fl. Bor. Am. vol. ii. p. 101.

Hab. Banks of Flat-head River (not seen along the Platte), and on the Kooskooskie. *n.* 183.

1. Limosella *aquatica*, L.—Hook. Fl. Bor. Am. vol. ii. p. 100.

Hab. Springy ground, high hills of Upper Platte, near Scott's Bluffs. July. *n.* 271.

1. Synthyris *reniformis*, Benth. in De Cand. Prodr. vol. x. p. 454.—Wulfenia reniformis, *Dougl. in Hook. Fl. Bor. Am. v. 2. p.* 102. *t.* 170.—β. *major;* foliis crassioribus subcoriaceis magis rotundato-cordatis, sinu angusto, margine multi-lobulatis, lobulis crenatis, spica longiore multiflora.

HAB. β. Fertile northerly slopes of the Snowy Mountains, highlands of Nez Percez. June. *n*. 421.

2. Synthyris *plantaginea*, Benth. in De Cand. Prodr. vol. x. p. 455.—Atelianthus veronicoides, *Nutt. in Herb. nostr.*

HAB. High stony plains, Upper Missouri territory, and sunny alpine situations, Upper Oregon. May, June. Apetalous. *n*. 230.—Everywhere pubescent. In fruit the capsule is invested with the permanent enlarged calyx. Mr. Nuttall found this species in the Rocky Mountains, Upper California. In our specimens the flower is decidedly apetalous.

1. Castilleja *pallida*, Kth.—Benth. in De Cand. Prodr. vol. x. p. 531. Hook. Fl. Bor. Am. vol. ii. p. 105. C. septentrionalis, *Lindl. Bot. Reg. t.* 925.

HAB. Rare, on hills of Platte, along rivulets; abundant on the islands of the Upper Colorado. Leaves always entire. Bracts pale yellow. June, July. *n*. 150.—Bentham, I am aware, quotes the above figure of Dr. Lindley as true *C. septentrionalis*, but it is at variance with his character of that species.

2. Castilleja *miniata*, Dougl. in Hook. Fl. Bor. Am. vol. ii. p. 106.

HAB. Stoney clayey denuded situations in the valley of the upper Sweet-water River, near Wind-river Mountains. Bracts brownish, with yellow stripes. July. *n*. 83.

3. Castilleja *hispida*, Benth. in Hook. Fl. Bor. Am. vol. ii. p. 105. C. coccinea, *Lindl. Bot. Reg. t.* 1136.

HAB. Prairie plateaus of the Nez Percez mountains. The most elegant of the species, varying in innumerable shades of colour, between white, orange, and crimson. May. *n*. 377. Desert of Upper Colorado, under *Artemisia cana*, on clayey banks. July, August. Bracts yellow and scarlet variegated. *n*. 511. *C. desertorum*, Gey. MSS.—Except in colour, I do not see how these specimens of Mr. Geyer's *C. desertorum* (*n*. 511) differ from what I consider to be a mere form of *C. hispida* (*n*. 377); but, when living, characters probably manifest themselves.

4. Castilleja *septentrionalis*, Benth. in De Cand. Prodr. vol. x. p. 522, vix Lindl.! (Bot. Reg. t. 925.)—Hook. Flor. Bor. Am. vol. ii. p. 105.

HAB. Amongst masses of *Phalangium esculentum*, in the very fertile, moist valley of Cœur d'Aleine river. Bracts ochre-yellow. April.

May. *n*. 291.—I follow Mr. Bentham in calling this *C. septentrionalis*, but it is surely not the plant so named by Dr. Lindley. This also seems to me to be a pale variety of *C. hispida*.

5. Castilleja *sessiliflora*, Ph.—Benth. in De Cand. Prodr. vol. x. p. 531. Euchroma grandiflora, *Nutt.*

HAB. Gravelly hills, Lower Platte, near Kansas River. April, May. *n*. 232.

1. Orthocarpus *hispidus*, Benth.—Hook. Fl. Bor. Am. vol. ii. p. 104.

HAB. Sunny grassy borders of exsiccated watercourses, Spokan plains, at Tschimakain, rare. Corolla pale yellow. July. *n*. 540.

2. Orthocarpus *luteus*, Nutt. O. strictus, *Benth. in Hook. Fl. Bor. Am. v.* 2. *p.* 104. *t.* 172.

HAB. Saline, depressed, and exsiccated places in the plains of Sweet-water River. July. *n*. 8.

3. Orthocarpus *bracteosus*, Benth. in Hook. Fl. Bor. Am. vol. ii. p. 104.

1. Cordylanthus *ramosus*, Nutt. MSS.—Benth. in De Cand. Prodr. vol. x. p. 597.

HAB. Stony places and declivities of the Upper Sweet-water River. Bracts green, striped with yellow. August. *n*. 111.

1. Pedicularis *racemosa*, Dougl. in Hook. Fl. Bor. Am. vol. ii. p. 108.

HAB. On the northern declivity of a high mountain, at the Cœur d'Aleine River, near the mission St. Joseph, growing under *Myginda myrtifolia*. It branches from the base. Corolla lurid-yellow. June. *n*. 434.

2. Pedicularis *bracteosa*, Benth. in Hook. Fl. Bor. Am. vol. ii. p. 110.

HAB. Shady young woods, highlands of Nez Percez. June. Very erect. Corolla dull yellow. Stem hollow. *n*. 422.

VERBENACEÆ, *Juss.*

1. Verbena *bracteosa*, Mx.—Hook. Fl. Bor. Am. vol. ii. p. 117.

HAB. Fort Walla-Walla. *n*. 656.

2. Verbena *paniculata*, Lam.—Hook. Fl. Bor. Am. vol. ii. p. 117.

HAB. Stony banks of Kooskooskie River. July. *n*. 454.

1. Lippia *nodiflora*, Rich. in Mich. Fl. Am. vol. ii. p. 15.—Schauer, in De Cand. Prodr. vol. xi. p. 585.

HAB. Borders of exsiccated, stony, low places, between Platte and Sweet-water Rivers. *n*. 257.

PRIMULACEÆ, *Juss.*

1. Dodecatheon *integrifolium*, Mx.—Hook. Bot. Mag. t. 3622, et Fl. Bor. Am. vol. ii. p. 119.

HAB. Saline swampy grassy plains of Lower Platte, with "*Iva axillaris, β stricta*," and "*Plantago eriopoda.*" June. *n.* 137.

2. Dodecatheon *frigidum*, Cham. et Schlecht.—Hook. Fl. Bor. Am. vol. ii. p. 110.

HAB. Low fertile ridges, Cœur d'Aleine valley, very abundant. Flowers white and rose. *n.* 621.—Open mountain slopes, rocks and stony plains, Upper Oregon. April. *n.* 620.—Varying in colour from white to rose, or pale purple or rosé, and in the scape from one- to five- or six-flowered, and also in the breadth of the leaf, sometimes oblong-spathulate, and sometimes ovate and suddenly petiolate.

1. Lysimachia *ciliata*, L.—Hook. Fl. Bor. Am. vol. ii. p. 122.

HAB. Thickets along rivulets; plains of Upper Oregon. July, August. *n.* 461.

LENTIBULARIEÆ, *Richard.*

1. Utricularia *vulgaris*, L.—Hook. Fl. Bor. Am. vol. ii. p. 118.

HAB. Muddy margins of Cœur d'Aleine Lake. June. *n.* 431.

PLANTAGINEÆ, *Juss.*

1. Plantago *eriopoda*, Torr. et James, Pl. of Rocky Mountains, p. 237.

HAB. Saline exsiccated sunny plains of Lower Platte, with *Glaux maritima* and *Triglochin maritimum.* June. *n.* 136.

2. Plantago *gnaphalioides*, Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 124.

HAB. About the burrows of the prairie marmot, and on denuded spots on the high plains of Lower Platte, to the Upper Columbia. June. *n.* 138.

NYCTAGINEÆ, *Juss.*

1. Oxybaphus (Calymenia) *angustifolius*, Nutt.—Choisy in De Cand. Prodr. vol. xiii. p. 433.

HAB. On the gravelly and somewhat calcareous slopes of the hills of Upper Platte. Flowers rose-red. Common on the Upper Missouri, about the Teton River, with "*C. decumbens*" and "*hirsuta.*" July. *n.* 270.

1. Abronia *mellifera*, Dougl.—Hook. Bot. Mag. t. 2879.—Hook. Fl. Bor. Am. vol. ii. p. 125.

HAB. Gravelly banks on the drift-sand plains at the mouth of the Walla-Walla, near Upper Columbia, growing quite prostrate. *n.* 631.

2. Abronia *fragrans*, Nutt.

HAB. On loamy, sandy, firm banks, within the high drift-sand hills of the Lower Platte. Two feet long. Umbels large. Flowers porcelain-coloured, opening only at night, very fragrant; growing with "*Rumex venosus*" and *Psoralea arenaria*, Ph. June. *n.* 157.

1. Tripterocalyx *macrantha*, Torrey in Fremont's 1st Report. Apaloptera annua *and* Cycloptera annua, *Nutt. MSS. in Herb. nostr.*

HAB. Platte, *Nuttall*, *Gordon*. Amongst *Opuntia Missurica*, in the high sandy plains between Platte and Sweet-water Rivers, with *Cynoglossum*, *n.* 186, and *Eriogonum annuum*. Flowers lurid; a rare plant, *Geyer*, *n.* 162.

CHENOPODEÆ, *Juss.*

1. Corispermum *hyssopifolium*, Stev.—Hook. Fl. Bor. Am. vol. ii. p. 125.

HAB. Drift-sand plains, mouth of Lewis and Walla-Walla Rivers. Common. September. *n.* 655.

1. Chenopodium *album*, L.—Hook. Fl. Bor. Am. vol. ii. p. 127; *var.* angustifolium.

HAB. Scattered on the hills of the badger and marmot burrows, in the high plains of Platte and the Upper Missouri. *n.* 31.

1. Atriplex (Obione) *arenaria*, Nutt.—Moq. in De Cand. Prodr. vol. xiii. p. 107.

HAB. Clayey calcareous saline cliffs at Ham's Fork of Upper Colorado River, Missouri territory. July, August. *n.* 62.

2. Atriplex (Obione) *canescens*, Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 128.

HAB. Loamy saline sunny exsiccated watercourses and ravines of Upper Platte. June. *n.* 107.

3. Atriplex (Obione) *Gordoni**, Moq. in De Cand. Prodr. vol. xiii. p. 114 (sub nom. *Obione Gardneri*).

HAB. Saline loamy exsiccated places in the defiles of the calcareous hills of Upper Colorado. August. *n.* 104.

4. Atriplex *rosea*, L.—Moq. in De Cand. Prodr. vol. xiii. p. 92.

* The word *Gardneri* is surely, in De Candolle's Prodromus, a misprint for *Gordoni*. Mr. Gordon (not Mr. Gardner) botanized in La Platte.

Hab. Saline argillaceous moist places of the Upper Platte. Abundant on the Missouri with "*Allium striatum.*" June, July. *n.* 61.

1. Kochia *prostrata*, Schrad.—Moq. in De Cand. Prodr. vol. xiii. p. 132.

Hab. Saline loamy watercourses of the calcareous hills of Upper Colorado River. August. *n.* 101.

1. Fremontia *vermicularis*, Torr. in Fremont's 1st Rep. Batis? vermiculata, *Hook. in Fl. Bor. Am. v.* 2. *p.* 128. Sarcobatus Maximiliani, *Nees, in Bot. Zeitung*, 1844, *cum Ic.* Sarcanthus, *Nutt.*

Hab. Saline clayey and sandy desert between Upper Platte and Sweetwater River. A shrub 3–8 feet high, with spinescent branches and succulent leaves, called *Salt-Cedar* by the trappers. Occurs also at the mouth of Lewis River, Upper Oregon. July. *n.* 242.

1. Grayia *polygaloides*, Hook. et Arn. Bot. of Bech. Voy. vol. i. p. 338. Hook. Ic. Pl. t. 271. G. spinosa, *Moq. in De Cand. Prodr. v.* 13. *p.* 119. Chenopodium? spinosum, *Hook. Fl. Bor. Am. v.* 2. *p.* 127.

Hab. Clayey banks in the drift-sand districts of the Upper Platte, near Sweet-water River, growing with *Fremontia*, 3 feet high. July. *n.* 64.

Polygoneæ, *Juss.*

1. Rumex *domesticus*, Hartm.—Hook. Fl. Bor. Am. vol. ii. p. 129.

Hab. Alluvium of the Kooskooskie, common. May. *n.* 351.

2. Rumex *venosus*, Ph.—Hook. Fl. Bor. Am. vol. ii. p. 130. t. 174.

Hab. Drift-sand hills, Lower Platte: appears also at the mouth of the Walla-Walla, Upper Columbia. The fruit changes from green to scarlet. *n.* 384.

3. Rumex *Acetosa?*, L.—Hook. Fl. Bor. Am. vol. ii. p. 129.

Hab. Wet meadows, Nez Percez highlands, rare. *n.* 488.—Lower leaves lanceolate. An sp. distincta?

1. Polygonum *Bistorta*, L.—Hook. Fl. Bor. Am. vol. ii. p. 101. P. bistortoides, *Ph.*

Hab. Moist deep grassy meadows, on the high and cold plains of the Nez Percez Indians, with "*Veratrum viride.*" *n.* 405.

2. Polygonum *amphibium*, L.—Hook. Fl. Bor. Am. vol. ii. p. 131.

Hab. Muddy margins of sloughs, valley of the Columbia River, near Fort Colville. September. *n.* 632.

3. Polygonum *Hydropiper*, L.—Hook. Fl. Bor. Am. vol. ii. p. 132.

HAB. Sunny rocks, Kooskooskie Valley. June. *n.* 355.

1. Eriogonum *alatum*, Torr. in Frem. Rep.—*var. β, elatum*, Gey. MSS., non Dougl.

HAB. β. On trap rocks, opposite the Red Butter, between Platte and Sweet-water Rivers, on banks of deep and ferruginous loam. Corolla yellow; rare. July. *n.* 145.

This has quite the habit of *E. longifolium;* and Mr. Bentham observes that Mr. Nuttall's specimens are much more woolly than Mr. Drummond's: but the leaves of the present plant are not woolly at all, simply downy and pilose with soft hairs, and of the same colour on both sides. If a new species, as is very probable (but my specimen is scarcely in flower), it may bear the name given to it by Mr. Geyer.

2. Eriogonum *flavum*, Nutt. in Fras. Cat.—E. flavum *et* E. crassifolium, *Benth. in Linn. Trans. v.* 17. *p.* 408.

HAB. On calcareous rocks in the "Black Hills," a range of mountains the Upper Platte and Sweet-water Rivers. July. Sometimes as many as thirty stems arise from the same root. *n.* 15.

3. Eriogonum *gnaphalodes*, sp. n.; undique dense albo-lanatum, caulibus brevibus laxe ramosis subcæspitosis, foliis oblongis in petiolum longe angustatis, involucris ad apicem pedunculi simplicis subcapitatis umbellatisve tubulosis 5-dentatis albo-lanatis, perigoniis minimis extus basi pilosis, laciniis interioribus sub anthesi minoribus oblongis. *Benth.*

HAB. High calcareous cliffs, Upper Platte. Flowers brownish-yellow, very small. June. *n.* 158.

Caules basi sublignosi, ramis 3–4-pollicaribus foliatis, undique uti folia pedunculi et involucra lana densa molli nivea obtecti. *Folia* subpollicaria, petiolo pariter pollicari. *Pedunculi* 2–4-pollicares. *Bracteæ* sub capitulo v. umbella paucæ, foliaceæ, flores superantes. *Involucra* 8–10, angusta, dentibus acutiusculis. *Perigonia* vix $\frac{3}{4}$ lin. longa. *Benth.*

4. Eriogonum *stellatum*, Benth.—Hook. Fl. Bor. Am. vol. ii. p. 135.

HAB. Moist stony sunny slopes of ravines, in the high stony plains of Upper Sweet-water River, near Wind-river Mountains. July. *n.* 241. Rather more woolly than the specimens originally described.

5. Eriogonum *umbellatum*, Torr. in Ann. Lyc. Nat. Hist. vol. ii. p. 241. —Hook. Fl. Bor. Am. vol. ii. p. 135.

HAB. *β. majus.* Stony moist ravines, Upper Missouri territory at Flat-head River, on the moist sterile soils. Flowers vary from buff to yellow. *n.* 241 and 403.—These specimens exactly agree with the original specimens of Nuttall in my Herbarium.

5. Eriogonum *heracleoides,* Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 135.

HAB. Stony places, valley of Kooskooskie River, growing with *E. macrophyllum.* June. *n.* 396.

6. Eriogonum *compositum,* Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 135. —*var.* leianthum; involucris submembranaceis glabris v. vix lanatis.

HAB. On bare trap rocks, "Upper Pelouse River," between Spokan and Kooskooskie. July. *n.* 410 and 470.

7. Eriogonum *niveum,* Dougl. in Benth. l. c. p. 414.

HAB. Most sterile places, valley of Columbia River, near Fort Colville, and in open stony ravines, upper plains of higher Lewis River. Flowers white or rose. *n.* 590.

8. Eriogonum *microtheca,* Nutt. Pl. Gamb. in Proc. Acad. Sc. Nat. Philad. p. 9, *var.* laxiflorum. E. laxiflorum, *Nutt. MSS.*

HAB. Stony places about the soda springs of Upper Bear River, rare. Flowers always white. *n.* 253.—Discovered by Douglas on Mount Hood, but omitted in the Fl. Bor. Am.

9. Eriogonum *brevicaule,* Nutt. Pl. Gamb. in Proc. Acad. Sc. Nat. Philad. p. 9 *c.*—*β.* floribus paulo majoribus.

HAB. Stony ridges of Upper Platte plains, rare. 1 foot high, a small woody shrub. *n.* 139.—*β.* On a stony sterile ridge at Fort Vasco, Black Fork of Upper Colorado. August. *n.* 210.

10. Eriogonum *annuum,* Nutt.?

HAB. Stony ravines near the "Wind River" Mountains, etc., Colorado; common on the "Black Hills" of Upper Platte. *n.* 661. Not in flower, and I am rather doubtful about the species.

11. Eriogonum *cernuum,* Nutt. Pl. Gamb. l. c. p. 8.

HAB. Amongst *Opuntia Missurica,* in the descent between Upper Platte and Sweet-water River, rare. Corolla white. *n.* 151.

12. Eriogonum *salsuginosum;* annuum, glabrum, glaucescens, dichotome v. verticillatim ramosissimum, ramulis erectis, foliis imis alternis oblongis spathulatisve sub ramificationibus oppositis verticillatisve basi connatis linearibus, involucris alaribus sessilibus v. ramulos filiformes terminantibus inæqualiter 5-partitis, perianthiis hirtellis.—Stenogonum salsuginosum, *Nutt. Pl. Gamb. l. c. p.* 13.

Hab. On saline clayey soils, within the high calcareous hills of the Upper Colorado. *n.* 100.

This has the ramification nearly of *E. angulosum*, and the leaves are in like manner from two to four together at each branching, but, instead of proceeding from the inside of the stipules or bracts, they are the foliaceous development of the bracts themselves. The divisions of the involucre are very unequal and free almost to the base, but not entirely so, as supposed by *Nuttall*, at least in our specimens; the flowers are precisely those of *Eriogonum*, the fruit has its angles remarkably prominent and acute, but that circumstance appears to be hardly sufficient to found a genus upon*.

13. Eriogonum *divaricatum*, sp. n.; annuum, humile, pubescens, ramis divaricatis dichotomis, foliis petiolatis ovatis crassiusculis, radicalibus rosulatis, ramealibus ad dichotomias intra bracteas geminis fasciculatisve, involucris alaribus sessilibus ramulosve breves terminantibus minutis hemisphæricis profunde 5-fidis, perigonii hirtelli laciniis oblongis subæqualibus.

Hab. On saline clayey soils, within the high calcareous hills of the Upper Colorado. *n.* 92.

Herba 3–4-pollicaris, a basi sæpe multicaulis. *Folia* radicalia 3–5 lin. longa, obtusa, basi angustata, petiolo subsemipollicari. *Bracteæ* ad ramificationes breviter connatæ, oblongæ, inferiores interdum in folia expansa, superiores minimæ. *Folia* intra bracteas radicalibus similia, gradatim minora. *Involucra* vix lineam longa. *Perigonia* semilinearia v. paulo longiora.

(*To be continued.*)

On the Botanical Labours of the Vellosian Society *of* Rio Janeiro, *and of its President* Dr. Allemão; *by* George Bentham, Esq.

Some account of the Proceedings of this Society, apparently published at Rio Janeiro, under the name of "Trabalhos da Sociedade Vellosiana," in a work entitled 'Bibliotheca Guanabarensis,' having been lent to me by my friend Mr. Miers, together with some detached papers

* In Mr. Bentham's Paper on *Eriogoneæ* in the Linnean Transactions, the number of teeth of the involucre in Eriogonums is stated to be six; it is however more frequently five, but varies often in the same specimen to six or even seven, and is sometimes reduced to four or three.

by Dr. Allemão, printed for private circulation among its members, I have thought that a short notice of them might not prove uninteresting, as showing the progress now making in the Brazilian Capital in the study of the extraordinary rich botanical treasures of their empire.

The "Trabalhos" commence with a report on the formation and first labours of the Society, read by the secretary at their meeting held on the 31st March, 1851.

The Vellosian Society for the study of Natural History, deriving its name from the Canon Velloso, patriarch of Brazilian botanists, was established in September, 1850, under the auspices of Dr. Francisco Freire Allemão, whom these papers show to be not only a most zealous naturalist, but one who places himself on a level with the present state of botanical science in Europe. It then consisted of a nucleus of twelve original members, divided into four sections: *Mineralogy*, with four members; *Botany*, with four members (Dr. Allemão, Dr. G. S. de Capanema, Dr. L. Riedel, and Sen. B. J. de Serpa Brandão); *Zoology*, with two members; and *Indigenous Languages*, with two members. Dr. G. S. de Capanema was appointed Provisional Secretary, and D. E. J. de Silva Maia, Treasurer. Corresponding members were named in the several provincial towns of Pará, Maranhão, Ceará, and Bahia, and in the provinces of Minas Geraes, San Paulo, and Matto Grosso. The appointment of foreign honorary members was deferred until the Society should have given ample proofs of its development and progress.

The proceedings of the Society at their different meetings are reported in the usual form, and the papers laid before it are printed, several of them accompanied, as well as Dr. Allemão's detached descriptions, by lithographic plates, most of which do great credit to tropical artists, and might even put to shame some of the lithographic botanical plates which have recently appeared in our own country.

Besides several zoological and geological papers, the following relate more or less to Botany.

1. *On* Machærium heterapterum, *sp. n.; by the President, Dr. Allemão, with a plate.*

This is a timber-tree attaining a considerable altitude in the virgin forests, and known to some dealers under the name of *Angelim* (given to it on account of the similarity of its wood to that of another more common tree called *Angelim amargoso*); it is nevertheless scarce, and Dr. Allemão had himself only twice seen single trees of it; once in the

Serra de Genecinó, and again in the mountains at the source of the Rio Grande de Jacarepaguá, both in the province of Rio Janeiro. The ample and accurate description and plate show it to be a new and remarkable species, belonging to a section of the genus distinguished both by its general habit and by the form of the fruit and venation of the wing, as well pointed out by Dr. Allemão. This section, which may be called *Tipuana*, includes the *M. grandiflorum* (Benth. in Hook. Journ. Bot. vol. ii. p. 67), and *M. Tipu**, a hitherto undescribed species found by Tweedie in the Parana.

2. *On the native name of the* Eugenia pedunculata, *or* Ibâpytonga *of the Brazilians; by I. J. Matta. (Section of Indigenous Languages.)*

The author discusses and corrects the spelling and consequent etymology and meaning of this name as given by A. de St. Hilaire after Marcgrav and Piso. He shows that it should be *Ibâpytanga* or *Ybâpytanga*, or *fruit with colour*, not *Ybipytanga* or *Ibipitanga*, which can only mean *child* (or rather *fœtus* or *infant*) of the earth.

3. Ferreira spectabilis, *a new genus of* Leguminosæ; *by Dr. Allemão, with a plate.*

This is another large forest-tree, of which I am not aware that we have any specimens in our herbaria. With the fruit very closely representing that of the *Machæria* of the above-mentioned section *Tipuana*, it has the inflorescence and flowers of a *Bowdichia*, only much smaller. It must therefore, as proposed by Dr. Allemão, constitute a distinct genus of *Sophoreæ*, next to *Bowdichia*. The wood is known by the name of *Sepepira amarella*, *Sepepira* or *Sebipira* being the name generally given to the Brazilian *Bowdichiæ*.

4. *On the structure and functions of the excretory hairs of the Brazilian* Urtiga braba, *or* Urtica nitida *of Velloso; by Dr. Allemão, with a plate.*

* Machærium (Tipuana) *Tipu*; inerme, ramulis puberulis glabratisve, foliolis 11–21 ovali-oblongis emarginatis utrinque parce pilosulis, paniculis terminalibus laxis, calycibus pedicellatis turbinato-campanulatis glabriusculis, corolla ampla glabra, legumine crasso costato ala cultriformi venis crebris arcuato-transversis.—*Arbor. Foliola* 1–2-pollicaria, utrinque viridia, tenuiter penninervia, subtus secus costam in sicco nigro-maculata. *Inflorescentia* fere *M. grandiflori*. *Corollæ* majores, fere *Platypodii*, flavi. *Leguminis* stipes 4 lin. longus, corpus 6–7 lin. oblique rhombeum v. ovatum valde convexum longitudinaliter costatum, ala 2–2½ poll. longa, medio 8–11 lin. lata, margine stylifero fere recto, altero curvo tenui undulato, venatione omnino *M. grandiflori*.

A large free-flowering handsome tree, known in the Parana by the name of *Tipú of Peru*, and giving its name to the valley of Tipuana, where the best gold in the Parana is found. *Tweedie*.

This is an anatomical description of the structure of the stinging hairs of this Brazilian Nettle, and of the mechanism by which the author believes that the acrid juice is injected into the wound. He believes that the inflected globular end of the hollow stinging hair is broken off as it penetrates the skin, thus opening an orifice for the discharge of the acrid liquor always contained in the vesicular base of the hair. The plate gives highly magnified figures illustrative of the anatomical details.

5. *Notes illustrative of the history of the Forest-trees of Brazil, especially of the province of Rio de Janeiro; by Dr. Allemão.*

After some general observations, this paper contains a list of the most valuable of the trees which the author has had more or less opportunity of studying, arranged in their Natural Orders under their native names, with the addition of the scientific names of such as he has been enabled to determine, further details being reserved for future communications. The list contains ninety-eight trees, of which thirty-five belong to *Leguminosæ*, six each to the *Lecythideæ* and *Laurineæ*, five to each of the *Bignoniaceæ*, *Sapotaceæ*, and *Meliaceæ*, and the remainder dispersed through sixteen other Orders. Of this number seventy at least are stated to supply good building timber, the remainder being generally classed among *madeiras brancas*, or *white woods*. Dr. Allemão observes however upon the extreme difficulty of classing the woods according to their qualities, from the vague use made of such designations as *páo bom* and *páo átõa*, etc., which may be rendered as *useful* and *useless woods*: many, he says, which were formerly neglected as too common and useless, are now turned to account and gaining in estimation.

Among the observations which follow on the local names of trees, we see the explanation of the specific name of *legalis*, not unfrequently taken up by Velloso in the 'Flora Fluminensis.' The term of *legal* or *royal* trees or woods, is commonly applied in Brazil to those trees which, being reserved for naval constructions, individuals were by law prohibited from felling.

Looking over the list for such names of woods as are more or less familiar to us, I was struck with that of *Jacaranda*, generally given as the Brazilian name of our cabinet-makers' *rosewood* (the *palissandre* of the French), which is here applied exclusively to several species of *Machærium*, thus again unsettling our ideas as to the tree which sup-

plies this valuable and most extensively imported article, which the researches of Guillemin had been supposed to have fixed.

The name of *Jacaranda* appears to have been first taken up botanically by Jussieu, in his 'Genera Plantarum,' who established under that name a genus of *Bignoniaceæ*, founded on one of the two plants mentioned under the same name by Marcgrav and Piso, and since then it has been generally supposed that this Bignoniaceous tree supplied our rosewood.

The species however described and figured by Marcgrav and Piso, is their *Jacaranda ligno albo*, and, like others of the same Bignoniaceous genus, has a soft white wood. The *Jacaranda ligno nigro* of the same authors, from Bahia, or *palo santo* (from whence probably the French *palissandre*), is not otherwise described.

G. Don, in his 'General Dictionary,' gives the *Physocalymma* of Pohl as our rosewood, but that mistake arises from a mis-translation of the German name. The *Rosenholz* of the Germans, or *bois de rose* of the French (so called from its colour, not from its scent), is our *tulip-wood*, very little used by our cabinet-makers, but of which many beautiful specimens were amongst the French furniture at the Great Exhibition.

In Lindley's 'Vegetable Kingdom' allusion is made to a *Mimosea*, as furnishing our rosewood, but upon what authority is not stated.

The late Dr. Guillemin, during his mission to Brazil connected with the project of introducing the culture of tea in Algeria, took considerable pains to ascertain the origin of the several woods imported into France, and brought home specimens of two *Dalbergiæ* (*Trioptolemæ*) as being without doubt the Brazilian *Jacaranda*, or French *Palissandre*.

We must however consider the disadvantages under which a casual traveller, however ingenious, must labour in inquiries of this sort, compared to a resident, possessing the eminent qualifications shown by Dr. Allemão, who has made the timber-trees of his country the special subject of his researches. Rejecting therefore all previous theories, we must no longer entertain any doubt that the *Jacaranda* of commerce is one of the six *Machæria* enumerated by him under that name. Three of these, *M. firmum* (Jacaranda *roxo*, or *purple*), *M. incorruptibile* and *M. legale* (both called Jacaranda *preto*, or *black*), are known to us both by Velloso's figures and by specimens; the three others are named only, not described, by Dr. Allemão. It is to be hoped that he will continue his researches, and make us better acquainted with the numerous vegetable products we import so largely from his country.

6. *Account of an Excursion to the Fazendo de Guaxindiba, near San Gonçalo, with the description of a new genus of* Artocarpeæ; *by Dr. Allemão.*

Soaresia nitida is the name the author here gives to what appears to be a good genus, allied in some respects to *Pseudolmedia* of Trécul.

7. *On the etymology of* Maracuiá *or* Murucuiá, *as applied to the Passion-flowers; by I. J. Matta.*

The detached papers by Dr. Allemão are nine in number, each accompanied by a plate. Eight are descriptive of seven new genera, belonging to *Leguminosæ*, *Combretaceæ*, *Apocyneæ*, *Nyctagineæ*, *Laurineæ*, and *Euphorbiaceæ*. Their characters have been transcribed by Walpers, in the 'Addenda Posteriora' to the third volume of his 'Annales Botanices,' and, after carefully going through these papers and the accompanying plates, I cannot find that any one of them is otherwise than well founded. Would that the same could be said of the majority of the so-called new genera, with which some continental botanists have of late years been inundating the science!

The ninth paper contains a short notice of the labours of Dr. Manoel Arruda da Camara, a Pernambuco botanist, who died at a very early age, leaving behind him, under the name of 'Centurias Pernambucas,' a considerable number of drawings and memoirs, illustrative of the flora of that province. These papers have come into the hands of Dr. Allemão, who proposes to publish them, commencing with the *Cochlospermum insigne*, here figured and described under Arruda da Camara's name of *Azeredia Pernambucana*. Dr. Allemão vindicates the restoration of this name on the ground of priority, Arruda da Camara's paper having been drawn up during the bishopric of Dr. José Joaquim de Azeredo Coutinho, to whom the genus is dedicated, that is, between the years 1798 and 1802. But these papers are stated by Martius to have been still in manuscript only in 1837, and the name of *Azeredia* cannot therefore be allowed to prevail over that of *Cochlospermum*, established by Kunth in 1822, and ever since universally adopted. It is now a settled rule, that even the reading a paper before a scientific society is not a publication sufficient to confer priority, until it be recorded in substance in the published proceedings of such body.

Versuch eines Commentars über die Pflanzen in den Werken von Marcgrav und Piso, etc. Attempt at a Commentary on the Plants in the works of Marcgrav and Piso on Brazil; with some further details concerning the Flora of that Kingdom. By Dr. C. Fr. Ph. von Martius. 1. *Cryptogames.* Munich, 1853, 4to. (From Memoirs of the Royal Bavarian Academy of Sciences. Cl. II. vol. vii. sect. 1.) Translated from the German by Dr. Wallich, V.P. Royal and Linn. Soc.

(*Continued from p.* 207*.)

Fungi Pisoniani.

Marcgrav's works contain nothing on this subject; whereas Piso alludes to it in his third book, de venenis eorumque antidotis (ed. 1648), p. 47; intimating that there are seven kinds of Fungi, known under different names, which he comprises under the general Tupis name *Carapucú*, without quoting any of them. Further, he says, that some are poisonous, indicated by losing their colour on being broken; which he seems to have had opportunities of noticing, as is apparent from the following characteristic account he gives:—"Inter venenatos qui sunt pejores, singultum excitant, intestina exulcerant, corpori ac faciei inducunt pallorem, urinam remorantur, arterias intercipiunt; ad hæc frigus, tremorem, sudorem frigidum, mortem denique afferunt." The following indigenous antidotes are recommended, independent of the usual alexipharmica, namely, the pungent, aromatic roots of native pepper shrubs: *Jaborandí, Artanthe Luschnathiana*, Miq. (unless his *A. obumbrata* is meant by "ed. 1, p. 97, fig. dextra"); *A. caudata*, Miq. (*ibid.* p. 96), and *Serronia Anisum* (Marcgr. vol. i. p. 69. Vell. Fl. Flum. vol. i. t. 55), which is still applied under the name of *Jaborandi;* besides the herb *Nhambú* (ed. 1, p. 89; ed. 2, p. 310), a *Composita* coming nearest to *Grangea.* The same accounts are repeated in the Hist. Nat. (1658) p. 309, with the addition of a woodcut, which however does not seem to be taken from a Brazilian painting, but to be copied from a figure of *Agaricus* (*Amanita*) *muscarius*, of some old Herbal. The original may be recognized perhaps in Clusius's Rariorum Plant. Hist. (1601), Fungi pernicial. p. cclxxx. xii. f. 4; repeated in Parkinson's Theatr. (1640), p. 1321, and, less rigorously, as well as in a reversed position, in J.

* The entire Introduction has been translated. But the nature of this Journal renders it necessary to give the remainder only in an abstract form.

Bauhin's Hist. vol. iii. (1651), p. 841, and in Chabræi Stirp. Sciagr. (1666), p. 588, f. 2. Considering the striking similarity of all these figures, we are justified in assuming, that Piso has not been over scrupulous in this, as in other cases, to stock his book with figures taken from others, and not referable to Brazilian plants. The *Ag. muscarius* has never been met with in that country either by myself or by other botanists.

(The author next proceeds to suggest what Piso may have meant by his nine sorts. *Trametes sanguinea*, Fries, is called *Urupé* in the Tupis language, and is recommended in Brazil against hæmoptysis, exactly as *T. suaveolens* is in Europe.)

The vegetation of Fungi in Brazil generally.—It is not seldom that tropical countries are considered as proportionably less fruitful in this family than in phanerogamic plants; but this is owing generally to our more confined knowledge of the former. Attracted by the magnificent flora, the travelling naturalist is diverted from its minor and less conspicuous forms, unless he continues in the country during a protracted period. He finds it difficult, besides, to bring back to Europe the more evanescent and difficultly preserved Fungi, on purpose to examine them there more leisurely. This class of vegetation is by no means less abundant in hot climates than in temperate ones, especially where there is much moisture in the soil and the atmosphere, which is proved at once, by our list of nearly 200 Brazilian species. The part which Linné assigns to Fungi, in Nature's great household, in our latitudes, is in like manner performed by them in tropical climates, where an excessive luxuriance of life, leads to a proportionate amount of decay: "Nomades, denudati, autumnales, fugaces, voraces, Flora reducente agmina colligunt earum quisquilias sordesque." I was repeatedly struck, in various parts of Brazil, with the amount and variety of its Fungi—emblems of the decay and death of a higher vegetation, and rising, as it were, from its tomb; f. i., in the wooded islands of the bay of Rio de Janeiro*, where, among various European sombre-coloured forms, I found the blood-red *Trametes sanguinea*, and a splendid *Trichia* (*expansa*) of crimson and yellow colour.

(The author then gives an account of the species of *Mycelium*, of Brazilian Fungi generally, and their contested place in the system, concluding with the list of species alluded to above. All this highly in-

* Voyage in Brazil, vol. i. p. 152.

teresting matter our space compels us to omit, with exception of the following observations on the phosphorescence of the tribe.)

Phosphorescence must be accounted as one of the most remarkable phenomena in this whole order. It has been placed beyond doubt, that luminosity, so far from being dependent on a commencing decomposition, is connected rather with energy of vitality, although it does not cease immediately on the individual perishing, but continues for some days after that event; and that the luminous *Agarici* produce the phenomenon in every part of their structure*. A similarly luminous *Agaricus* occurs in Brazil, namely, *A.* (*Omphalia*) *Gardneri*, Berk., growing on decaying sheaths and petioles of the Pindova Palm (*Attalea humilis*, Mart.), and thence called *Flor de Coco* by the inhabitants; found at Natividad, in the province of Piauhy, in the month of December. In the dark it emits from its surface a greenish phosphorescence, resembling that of the molluscous *Pyrosoma atlanticum*†. It is of an orange-yellow colour, like the luminous *A.* (*Crepidotus*) *olearius* of the Olive, in Southern Europe. A third phosphorescent kind is *A. noctilucens*, Léveillé (Gaudichaud, Voy. de la Bonite, vol. ii. p. 167), from Manila, which is of a white colour. The *Fungus igneus* of Rumphius (Herb. Amboin. lib. xi. p. 130, an *Agaricus*, or rather, probably, a *Cantharellus*) has its pileus grey above and black-grey beneath‡. Lastly, two phosphorescent species are reported to occur on the Swan River, in New Holland§. It is known that in Germany, it is not that sort of Fungi, but *Rhizomorpha fragilis* in its twofold forms (*R. subcorticalis* and *subterranea*), and *Helotium æruginosum* (*Byssus phosphorea*, Linn.), which possess any phosphorescence.

The genus *Hypochnus* (Fries, Syst. Orb. veg. i. p. 304), which is referred to the *Hypomycetæ* by that author (Syst. Myc. iii. p. 289), does not belong to the Order. *Hypochnus rubro-cinctus* (Ehrenb. Hor. phys. Berol. p. 84. t. 17. f. 3; Montagne in Ramon de la Sagra Cuba Cryptog. p. 369) is *Spiloma roseum*, Raddi (Memorie della Soc. Italiana in Modena, xviii. p. 343. t. 2), yielding the substance of

* Compare Schmitz in Linnæa, xvii. (1843), p. 487, on the structure, growth, and some peculiar vital appearances of *Rhizomorpha fragilis*, Roth; also Tulasne in Annales des Sc. Nat. i. p. 338 (1848), on the phosphoresence of *Agaricus olearius*, etc.

† Gardner's Travels in the Inter. of Braz. p. 346. Lond. 1846.

‡ "Incolæ eum adhibent nocte, manu eum tenentes, ut subsequentes detegant antecedentes per hunc fulgorem ne aberrent."—*Rumph.*, l. c.

§ Drummond in Hooker's Lond. Journ. of Bot. p. 216. 1842.

which, under the designation "*Cochenille végétale,*" a chemical analysis has been given by Vauquelin (Mém. du Mus. vi. p. 345). The presence of a red pigment, capable of becoming fixed, leaves no doubt as to the nature of this vegetable, which is found at Rio de Janeiro, S. Paulo, S. Catharina, and Minas, in such quantities, that its collection may be recommended for dyeing purposes. The fructification of this Lichen is unknown; while the two other species, *Hypochnus nigrocinctus*, Ehrenb. (l. c. t. 17. f. 4) and *H. albo-cinctus*, Mont. (l. c. p. 368) are thallus forms of *Chiodecton umbratum* and *Ch. lacteum*, Fée. Comp. Montagne in Ann. Sc. Nat. 3 Ser. vol. xvi. p. 76.

Algæ.

These are not mentioned at all by Marcgrav, and only one species by Piso, in whose first book *de aere, aquis et locis* (ed. 1648, p. 3), while giving an account of the weeds which prevail in the Brazilian ocean, the *Sargasso* of the Spaniards (*Sargassum bacciferum*, Ag.) is introduced, and more in detail in the second edition, p. 266, with an annexed woodcut, representing the ordinary form of this remarkable seaweed, without being copied from the earlier authors (Tabernæmont. ed. 1625, ii. p. 208; Lobel, Obs. p. 633, and Parkinson, Theatr. p. 1281). Acosta had already noticed (Aromata, ed. Clusii tertia 1579, p. 87) that seamen were in the habit of eating the plant, both raw and boiled, as a remedy against urinary troubles. Piso repeats the observation.

This class of Brazilian vegetation, both of fresh waters and the seacoasts, has hitherto been comparatively little examined. I have given seventy-nine species, contained in several groups of the order, in Flora Bras. i. 1833; and St. Hilaire's species, determined by Greville and published the same year, amount to forty-five. The algological labours of Montagne, of more recent date, have augmented the number to 141 species in Kützing's Species Algarum, namely, seventy-five species of the section *Isocarpeæ* and sixty-six of *Heterocarpeæ* of this author.

Lichens, Mosses, and *Hepaticæ* are not mentioned by our authors, and therefore beyond our limits.

Ferns.

Marcgrav speaks of this class of plants in the 2nd chapter of his 1st book (ed. 1, p. 2); Piso in the 54th chapter of his 4th book (ed. 2, p. 233, 234). The former has some *Leguminosæ* among his Ferns, of

which *Trifolii species copiosa in sinu omnium Sanctorum*, is difficult to determine; the second, *Trifol. americanum spicatum* (*Amores incolis*) is a *Desmodium*. At the end of the chapter the quotes *Ononis non spinosa et floribus luteis*, which is *Stylosanthes gujanensis;* which Piso in like manner mentions in the midst of his Ferns (l. c. p. 234), as if both authors had kept in view the qualities of plants in their mode of arranging them. To Marcgrav's first Fern, *Filix brasiliana*, is attributed "caulis quadratus ex rufo nigricans splendens lanugine rufa," which, with the rest of the description, points at some *Adiantum* with a pedate-pinnate frond. The same Fern is cited by Piso (l. c. p. 233) almost in the same words; but his figure does not, assuredly, belong here, but to some *Pteris;* while that in the next following page, of *Conambaimiri* (fig. sinistra), was intended no doubt for the *Filix brasiliana:* an instance of that faulty placing of figures, which M. Lichtenstein censures in the zoological parts of the works.

The following are briefly the results of the commentator's researches. *F. brasiliana* he considers to be *Adiantum curvatum*, Sw., found in all tropical Brazil, especially in forests not far from the sea. The *Pteris* figure alluded to points somewhat to *P. leptophylla*, *arachnoidea*, and as far as regards the pinnulæ sinuatæ, to *P. pallida*, Raddi. Marcgrav's second sort may be *Lygodium volubile* or *hastatum;* the third may be considered as *Blechnum brasiliense*, Desv., or perhaps *B. angustifolium*, Willd.; the fourth is referable to several Polypodiums with densely scaly, creeping stems and growing on trees. Piso's small figure, to the right of the *Adiantum*, is certainly meant for *Gymnogramme Calomelanos*, a common species in tropical Brazil.

The commentator now gives a general view of the Ferns of Brazil, which he reckons at 715 species, distributed among the following tribes and genera:—

POLYPODIACEÆ 525 species, namely, *Polybotrya* 5; *Olfersia* 2; *Acrostichum* 41; *Gymnogramme* 15; *Antrophyum* 4; *Ceterach* 1; *Grammitis* 4; *Xiphopteris* 2; *Meniscium* 6; *Tænitis* 2; *Cochlidium* 1; *Notochlæna* 3; *Polypodium* 99; *Pleopeltis* 6; *Cheilanthes* 13; *Adiantum* 57; *Jamesonia* 1; *Cassebeera* 3; *Allosorus* 1; *Pteris* 44; *Blechnum* 17; *Lomaria* 10; *Vittaria* 6; *Asplenium* 52; *Allantodia* 1; *Scolopendrum* 4; *Diplazium* 20; *Didymochlæna* 1; *Nepholepis* 7; *Aspidium* 61; *Cystopteris* 1; *Lindsæa* 13; *Davallia* 5; *Saccoloma* 1; *Balantium* 1; *Dicksonia* 13; *Pæsia* 1; *Cibotium* 1.

CYATHACEÆ 59: *Hemitelia* 5; *Alsophila* 45; *Metaxia* 1; *Cyathea* 8.
PARKERIEÆ 2: *Ceratopteris* 1; *Parkeria* 1.
HYMENOPHYLLEÆ 53: *Hymenophyllum* 22; *Trichomanes* 31.
GLEICHENIACEÆ 12: *Gleichenia.*
SCHIZÆACEÆ 55: *Aneimia* 46; *Schizæa* 5; *Lygodium* 4.
OSMUNDACEÆ 2: *Osmunda.*
MARATTIACEÆ 4: *Danæa* 2; *Marattia* 2.
OPHIOGLOSSEÆ 3: *Ophioglossum.*

(*To be continued.*) – apparently not – death of Wallich – G McB

Application of Pine-trees; by BERTHOLD SEEMANN.

It may be termed a fortunate occurrence, that at a time when the *Coniferæ* have become such universal favourites, and fairly occupy that position in our gardens to which their curious appearance, their strange habit, and their singular foliage entitle them, it should have been discovered that they possess some additional useful properties besides those previously known, proving them to deserve in every respect attention.

The increase of literature and international communication has of late years produced so great a demand for paper, that rags have become a rather scarce article, compelling manufacturers to try other vegetable substances for making paper: experiments have been set on foot with the roots of potatoes, the wood of Willows and Beeches, the leaves of Pines, the silky hair of Poplars, Thistles, and Cotton-grasses, with Moss, Straw, Beet-roots, and Nettles; but the result was that the substances were either totally unfit for the purpose they were intended to serve, or, if applicable, they were not procurable in sufficient quantities. Jute (*Corchorus capsularis*, Linn.), which is so well adapted for ropes, and even rags in the composition of which Jute occurs, are said to be unfit for manufacturing paper. The discovery of M. Gross, who has succeeded in making paper of the wood of *Pinus Abies*, Linn., must therefore be considered important. The wood used for this purpose must not be too old, and as far as possible be free from knots; branches are rejected. The wood is reduced to a pulp, which, after a certain, but very small quantity of linen has been added to it, undergoes the same process as that consisting of rags,—with this exception, we

are told, that the sheets do not require sizing. The only difference between writing-paper made of Pine-wood and writing-paper made of rags is that the former is not quite so white as the latter; but this defect M. Gross is in hopes of being able to remedy by bleaching. The printing-paper of Pine-wood is considered excellent, takes the ink readily, and is said to be superior to any other for printing in colours. Pasteboard made of Pine-wood is very strong, and is already much used on the Continent.

Another, though not quite so recent, discovery is that of M. Panewitz, near Breslau, preparing, by chemical decomposition of the leaves of *Pinus sylvestris*, Linn., a hemp-like fibre. This fibre, called in German "Wald-wolle," a term best rendered into English by "Pine-wool," is now extensively employed for stuffing pillows, cushions, and mattrasses, or instead of wadding. Its chief advantages are, according to the published testimonies of several railway directors and superintendents of hospitals, that it lasts very long, retains its elasticity, harbours no insects, and never becomes mouldy. It is also woven into blankets, counterpanes, and similar articles.

The manufacture of Pine-wool is carried on on a large scale at Humboldt's Au, about five German miles from Breslau. The liquid or decoction developed by the process, containing principally formic acid, ætheric oil, and resin, is used for medicinal baths, which are at present in high repute, and considered beneficial for cutaneous diseases, scrofula, and nervous and rheumatic complaints; it imparts elasticity and softness to the skin, especially if the strength of the liquid is increased by the addition of Pine-wool extract (*Extractum pinus sylvestris*), and the skin be washed with Pine-wool soap (*Sapo pinus sylvestris*). The Pine-wool oil (*Oleum pinus sylvestris æthereum*), applied to the skin, produces a similar effect to the baths, and if administered internally it has been found to answer as a vermifuge.

Specimens of the Pine-wool, and different articles manufactured of it, as well as of the extract, soap, oil, and pasteboard above mentioned, together with a series of notes on them, have lately been presented to the Museum of Economic Botany at the Royal Gardens at Kew, by Professors Goeppert and Treviranus; and these materials have been the chief sources of information in drawing up this brief notice of substances destined to become of considerable importance to mankind.

Letter from a Member of the "UNITED SOCIETY" (*usually denominated* "Shakers"), *Harvard, Massachusetts, U.S.A.*, *to* Dr. Asa Gray, *on the subject of the native Medicinal Herbs so extensively prepared by them for medicine; dated June* 8, 1853.

Several of our societies in the United States have, in consequence of their peculiar location not being adapted to extensive farming, preferred raising and preparing *Medicinal Herbs, Roots, Barks*, etc., for market, as an occupation peculiarly suited to a community associated together upon our principles. It furnishes a more healthy employment for a number of females than most of the labour performed by them at the present day, and it affords employment in the winter for men and women in preparing, packing, etc., ready for market.

It would be very difficult to give the exact amount of articles put up by our societies, or the amount of sales.

At this place we have been engaged, and gradually increasing in this business, for the last forty years: we have about three acres of garden, besides what we gather wild and buy yearly. We have been making extensive improvements during several years past, and are now prepared to meet the increasing demand for all articles growing in the Northern States which are included in the vegetable practice of medicine.

Out of thirteen of our societies in the United States there are but four that do much of this business, their locality being better adapted to farming and other purposes. One society of our brethren at New Lebanon have been longer in this business than ourselves, and carry on a very extensive trade. They have recently made great improvement in the manufacture of pure vegetable extracts, prepared *in vacuo* on scientific principles. They have had long experience, and have recently set up a steam-engine and other expensive apparatus of the latest improvements, for facilitating and improving the manufacture of the alcoholic and hydro-alcoholic, as well as the simple kinds of extracts and inspissated juices. They are now prepared to meet orders from all parts of the world; extracts prepared by them, I think, are not surpassed by any other manufactory in the world.

The amount of Herbs, Roots, etc., prepared by our societies cannot be less than twenty tons per annum; these articles, pressed in pound cakes, and papered in the neatest manner, average about 300 dollars per ton.

The leading articles are *Sage, Wormwood, Horehound, Boneset, Catnep*, etc. As the demand for different articles fluctuates in different years, we could not give the exact number of pounds of each article; but some years we have sold as much as 1000 pounds of some of the above mentioned, while of some of the minor varieties we do not sell ten pounds.

These articles are sold in all parts of North and South America, the Sandwich Islands, and China, and I am not aware that there has been much sold on the continent of Europe. For a few years past the Californian and Australian trade has required large quantities of our preparations.

If you would like to send to Sir William Hooker, for the Museum at Kew, specimens of Extracts in glass jars, each jar enclosed in a neat paper box, prepared by the society at New Lebanon, I will procure them of the Agent and forward them to you as samples free of cost*.

ELISHA MYRICK.

BOTANICAL INFORMATION.

Survey of Fijee Islands, etc.

Captain Denham has, fortunately for science, two naturalists on board H.M.S. Herald, now employed surveying that group of islands in the South Pacific Ocean, of which those of Fijee may be considered the centre,—Mr. Macgillivray (who was formerly naturalist in the Rattlesnake), and Mr. William Milne, assistant-naturalist. These gentlemen have not been idle, as we can testify by the arrival of the collections of plants which they have formed at the several places they have touched at on their way to Sydney, and as is shown by the following extract from Mr. Macgillivray's letter addressed to us from that Colony, dated February 23, 1853.

"The collection now sent contains about 680 species of Flowering Plants and Ferns, all numbered consecutively and catalogued. There are also a number of *Cryptogamia*, labelled of course, but not numbered,

* A very full set of the drugs in cakes, and extracts, is deposited in the Kew Museum.

as I take little interest comparatively in them, from knowing scarcely anything about them. They are from the following countries:—

"1. *Madeira*, about 123 species.—There is nothing regarding them worth noting here.

"2. *St. Vincent, Cape de Verd.*—'Although at this season (July, 1853), at the end of a long-continued drought, and before the periodical rains had fairly set in, I did not expect an extensive field for botanical research, I was yet unprepared for such a dearth of vegetation. During our visit only nineteen indigenous phænogamous plants were observed in flower: of these seven were Grasses. Three species of Ferns, among them *Adiantum Capillus-Veneris*, and six species of Lichens, were the only Cryptogamic plants, omitting Algæ, observed. Formerly there were trees upon the island; these are now all cut down, but from the stumps lateral branches have shot up into tall bushes, covering many acres of level ground in the salt marshes and in the shallow valleys along the course of the streams. This shrub or tree (*Tamarix Gallica*, L.), the "taruff" of the inhabitants, presents rather a bountiful appearance, from its spreading branches of pale green imbricated foliage, and long slender racemes of white flowers.'

"3. *Rio de Janeiro.*—While looking after zoology here, I of course collected some plants, but I do not suppose that there is a single one which is a desideratum in your herbarium. The number of Ferns (62 out of 182 or thereabouts) is larger than it would otherwise have been, because I was anxious to know the characters of the genera, having so good an opportunity; but I feel certain that I must have made several mistakes in the naming. However, I am not yet too old to learn, and shall probably do better next time I get into a Fern country.

"4. *Tristan d'Acunha.*—We were only a few hours on shore here, but I managed to get most of the plants, although I was more anxious about the few mollusca and birds, besides being interested in the little community of eighty-five souls whom we found there. Milne has probably got a few plants which did not occur to me, as he had nothing else to do. I found Carmichael's account of the botany of Tristan d'Acunha in Linn. Trans. vol. xii. in the public library at Cape Town; this enabled me to name most of my plants; there are two or three not mentioned in that paper. My notes on the botany are interspersed throughout the long account of the visit in my Journal. When you next write, I should feel extremely obliged by your mentioning the

names of any that I have misnamed or left unnamed, as I shall publish an account of our visit before our return.

"5. *Cape of Good Hope.*—I need not say a single word about the botany of this well-explored district, further than that you will find upwards of 300 species of plants in my collection.

"6. *St. Paul, South Indian Ocean.*—The few plants composing the scanty vegetation of this little island are of such peculiar interest to me, that I should feel extremely obliged by your giving me the names of the indigenous species, especially the common Grass of the island. We were at St. Paul about eleven days. We found a party of four people from Bourbon, collecting fish for the supply of that island.

"Nothing occurred of consequence to delay our voyage, and we reached Sydney on Friday, the 18th. Thus ended our voyage to the starting-point.

"Since writing the preceding part of this letter I have packed up the plants which I send you. The plan for our future proceedings has not yet, I believe, been matured: much depends on the condition of the 'Torch,' which may be expected in a few days. I believe however, from what Captain Denham (who has behaved towards me with uniform kindness, and affords me every assistance, such I believe as captain never before offered to a naturalist) has told me, that in about a month hence we go to the Isle of Pines, and return to Sydney after a six weeks' or two months' cruize. Of course I anticipate a rich harvest at that place, although much of my time will be taken up in vocabulary-making. Our first work of importance will be the survey of New Caledonia; and as our exploration will be more than a survey of the coasts for hydrographic purposes, I look forward with hope to our anticipated explorations in the interior, with a sufficient force to secure us from molestation from the natives. The following year, it is proposed, will be devoted to the Fijees, etc.

"Sydney has altered more than I expected to have found after so short an absence. Of course gold is the all-absorbing topic of conversation, and we already in our own little circle are becoming quite familar (in *talk* only, however) with the gold-fields. It has been found in New Caledonia, and some of us may pick up a nugget or two there; and I shall take care that mine are not preserved as mineralogical specimens. I have seen Mr. Moore here, but have not had a long conversation with him yet. The gardens are exceedingly creditable to his

taste and zeal, but I shall give you an account of them some other time. Milne has been actively employed collecting at all the places he has visited, and improves much in his way of preparing specimens."

Botanical News from Italy.

Florence, 13th July.

Part of my communication must again be concerning the diseases of plants, a topic which unfortunately promises fair to be inexhaustible in this country. As I told you in my last letter, not only has the disease of the Vine, but also a disease of the Corn, made its appearance; and now I see in an account of the Meeting of the Accademia dei Georgofili (of Florence), held on June the 5th, that one of the members exhibited branches of the Mulberry-tree, the leaves of which were completely spoiled by the effect of what is here called *fersa*, *seccume*, or *marino*. This disease is well known*; it formed the subject of long discussions in the scientific meetings held annually in Italy before the events of 1848; it is considered by some as caused by the presence of a parasitical fungus, first described about ten years ago by Dr. Sandri. The damage is usually limited to a small portion of the leaf, the rest of which remains untouched, and can therefore be given for food to the silkworms; but this year the whole surface of the leaf has been attacked, and to such an extent that breeders of silkworms have been obliged to throw away a considerable quantity of the caterpillars because either they had no food at all to give them, or the little that was left had risen to an enormous price. It is to be remarked that the Mulberry-tree of the Philippines has resisted the disease much better than the common one, in the same way that the American kinds of Vine have done compared to the European species.

Several other notes concerning diseases of plants were communicated in the above-mentioned meeting by different persons. Everybody is alive to the importance of this subject, and observations, good, bad, and indifferent, are daily accumulated. The scientific periodicals of Northern Italy contain many memoirs, reports, etc. on the subject; but as they throw no new light on the several points under discussion, it is needless that I should give any further account of them.

* The Mulberry disease has also made its appearance in the southern parts of France; according to Montagne, the fungus accompanying it in that country is the *Fusisporium cingulatum*, Mont.

In one of the latest meetings of the Accademia dei Georgofili a distribution of prizes took place for improvements in agriculture; one of them was awarded for the introduction and cultivation of the *Sulla* (*Hedysarum coronarium*) as fodder in Tuscany.

The last number of the Transactions of the Accademia de' nuovi Lincei of Rome contains a paper on *Melia Azedarach*, by the late Professor Donarelli, in which however I have found scarcely anything new.

The care of the botanical garden at this city has been confided to a new gardener. He seems an intelligent and careful young man, and hopes are entertained that the establishment will prosper under his hands.

Professor Parlatore is going to absent himself from Florence for a few weeks on account of his health. Mr. T. Caruel is about to start on a journey to the Apennines, and afterwards intends visiting the sea-coast.—*Bonplandia*, August 15, 1853.

Plants of M. Boivin.

We are requested to state that the following collections of plants formed by M. Boivin, an eminent botanical traveller in Madagascar and adjacent islands, are on sale in Paris, at 30 francs per 100 species; and any information respecting them may be procured from Mr. Graves, rue de Verneuil, n. 52, at Paris.

Madagascar plants: five collections of 52, 39, 35, 34 and 16 species each.

Isle Ste. Marie: six collections, 72, 55, 44, 37, 25 and 19.

Bourbon: seven collections, 389, 356, 324, 294, 262, 219 and 175.

Nossibé: four collections, 61, 41, 23 and 17.

Mayotte: seven collections, 172, 149, 132, 115, 90, 57 and 32.

Simon's Bay: eight collections, 50, 33, 32, 28, 21, 20, 17 and 15.

Herbaria for Sale.

Professor Billot, of Hagenau, who in 1846 commenced publishing dried specimens, correctly named, of the rarer species of the plants of France and Germany, still continues that task. He has lately sent out the tenth and eleventh century of specimens, and we may state, on

the authority of M. Kralik and from a perusal of the list which has reached us, that three-fourths of each century belong to the rarer and newly-discovered species. Sets of this *Flora Galliæ et Germaniæ exsiccata* may be had at the rate of 10 francs per century, from Professor Billot himself, from M. Buchinger in Strasburg, and from M. H. L. Kralik, 15, Avenue Marbœuf, Paris.

NOTICES OF BOOKS.

ARCHER, THOMAS CROXEN: *Popular Economic Botany, or description of the botanical and commercial characters of the principal articles of* VEGETABLE ORIGIN, *used for food, clothing, tanning, dyeing, building, medicine, perfumery, etc.* Reeve and Co.

This useful and well-illustrated little book might have been supposed to be modelled on those volumes of 'The Library of Entertaining Knowledge,' entitled "Description and History of Vegetable Substances used in the Arts and in Domestic Economy: I. Timber Trees, Fruits; II. Plants used for the Food of Man; III. Materials of Manufacture;" by Mr. Robert Mudie, author of several ingenious writings especially bearing upon Natural History. Like that work, too, the present is "one of a series of Essays written in a popular style." Mudie's work however must, we think, have been wholly unknown to the author of the 'Popular Economic Botany,' or the latter could not have asserted at the very outset of his work, "It will appear strange to many when they hear for the first time that no popular work has yet appeared, devoted exclusively to the commercial products of the Vegetable Kingdom."

To the editor of the 'Kew Garden Miscellany,' works of this nature cannot fail to be of peculiar interest, and he is not ashamed to acknowledge that he has derived much information as well as amusement from the above-mentioned "Description and History of Vegetable Substances." Unquestionably Mr. Archer has the advantage of Mr. Mudie, and has profited thereby, inasmuch as there is a far greater amount of knowledge on subjects connected with vegetable products now, than was the case twenty years ago; for it is too true that Botany had for a

long period been studied too little in relation to the services which man derives from the vegetable world. Much has now, as Mr. Archer justly observes, been written, and written well, in various large works on the products of the vegetable kingdom, "and from these writings," he continues, "much of the information contained in this volume is derived." Mr. Archer has moreover had great practical experience in commercial materials:—"Besides twelve years' employment in the import department of the Customs, which has brought me into contact with most of the articles of foreign produce, I also formed the extensive collection of Liverpool Imports which was exhibited at the Great Industrial Exhibition of 1851, for which I received the prize medal and certificate. Since then I have been acting for the Directors of the new Crystal Palace at Sydenham, as their agent for the collection of raw produce; and in these occupations I have obtained some information which I trust may be useful," etc. Hence it is that this work is so satisfactory in relation to the commercial value of vegetable products, "constituting (Mr. Archer tells us) nine-twelfths of the whole commerce in raw produce, which employs the vast mercantile marine of this great kingdom." The classification adopted, he continues to observe, in this work is "simple, being a mere division into groups." It is nevertheless, we think, not consequently clear or intelligible in what the reader will expect to find included under their respective heads. The first great division is, I. "SUBSTANCES USED FOR FOOD;" and that is subdivided into, 1. *Farinaceous Products*, but then here is only included farinaceous substances derived from the seeds of plants. 2. *Fruits*. 3. *Nuts*. Now Nuts are fruits in a botanical sense; but here the *seeds* are sometimes so called, as in the *Brazil-nut*, *Bertholletia excelsa;* at other times the hard external capsule is so denominated, as in the *Sapucaia-nut* or *Pot-plant*, *Lecythis olitoria*. 4. *Feculas* or *Starches*. 5. *Spices*, many of which are true *fruits* also; and this division is concluded by "*Miscellaneous Articles*." Division II. is headed "PRODUCTS EMPLOYED IN MANUFACTURES," but the only article under that is "Vegetables used for Textile Fabrics." Division III. is "MISCELLANEOUS PRODUCTS USED IN THE ARTS AND MANUFACTURING PROCESSES." 1. *Tanning Materials*. 2. *Materials used in Dyeing*. 3. *Gums used in the Arts*. 4. *Oils*, *Oil-seeds*, etc. 5. *Miscellaneous articles*, under which come *Tobacco*, *Cork*, *Rice-paper*, *Vegetable Ivory*, *Coquilla Nuts*, etc. etc. This may be considered, in one sense, a po-

pular arrangement,—certainly not a scientific one, nor one by which an ordinary reader could tell generally under what head he would find the object of which he was in search; but happily that is remedied by an alphabetical index of individual articles.

Mr. Mudie's three duodecimo volumes contain, we think, a more tangible arrangement of subjects. The first is devoted to the two great heads of TIMBER-TREES and FRUITS. Timber-trees are arranged mainly in satisfactory groups, *Oaks*, *Pines*, etc.; then an excellent yet quite popular description and history of each kind, concluding with a chapter on the applications of all the sorts. The numerous fruits described will hardly bear grouping further than as those *cultivated in Europe;* the *Orange;* the *Stone-fruits;* the peculiarly *Tropical fruits*, etc. The volume next published, I. "VEGETABLE SUBSTANCES USED AS FOOD FOR MAN," has first the *Cerealia* or *Corn-plants.* 2. The *Potato*, well deserving of a separate chapter. 3. Other vegetable substances used as *substantive food.* 4. *Wild plants* used as *food.* 5. On *Vegetable Gardening.* 6. *Leguminous Plants.* 7. *Succulent Plants.* 8. *Brassica; Spinaceous Plants; Asparagineous Plants.* 9. *Alliaceous Plants.* 10. *Acetarious Plants*, etc.; *Seasoning Herbs.* 11. *Esculent Fungi.* 12, 13. *Spices.* 14. *Coffee, Cacao, Tea, Sugar.* Mr. Mudie's third volume contains MATERIALS OF MANUFACTURES: and here is really a great amount of useful information, such as we believe no one work, foreign or English, can be found to embrace, arranged under the following heads:—I. *Substances* more peculiarly applied to *weaving; Flax and Cotton.* II. *Filaments* applicable to *spinning* and *weaving*, and applicable to *cordage.* III. *Materials* used for *matting* and *basket-making*, etc. IV. *Materials* used for *Paper.* V. *Materials* used in *Straw-plaiting.* VI. *Cork-wood, Teazles, Ulva marina.* VII. *Substances* used in *Tanning.* VIII. *Vegetable oils* and similar products (*essential, empyreumatic*, etc.). IX. *Alkalies.* X. *Acids.* XI. *Vegetable Dyes.* XII. *Resins.* XIII. *Gums* and *Gum-resins.* All these, of the three several volumes, illustrated with 210 woodcuts of a more or less satisfactory description.

We think we have shown that Mr. Archer's is not the first "popular work that has appeared, devoted exclusively to the commercial products of the Vegetable Kingdom." The arrangement of the subject-matter to which we allude, in either case may be, and probably is, sufficiently useful for *commercial* purposes; and to a certain extent the extensive,

and we say with pride, invaluable collection (not "too small to be of any great use," as Mr. Archer, we know not why, denominates it), in the Royal Gardens of Kew, was so arranged; that is, the *Fibres* and *Textiles* were brought together, the *Caoutchoucs*, the *Gums*, *Resins*, *Tannins*, *Dye-stuffs*, etc. etc. But, as a great scientific collection, belonging to a public *botanical* establishment, it was deemed more advantageous to visitors to arrange, as far as could be, every article in its proper place according to the Natural System, taking De Candolle's 'Universal Flora' for the guide. Thus, though it is quite true that different kinds of fibre are often placed apart from each other, yet we have, on the other hand, the inestimable advantage of seeing what each natural family yields: some, as the RANUNCULACEÆ, numerous *acrid* and *poisonous* substances; LINEÆ, *flax* and *oil*; MALVACEÆ, *fibres* and *emollients*, etc. etc. Undoubtedly it would be most desirable, if possible, to have a double arrangement, Commercial and Scientific: that would require considerable space, yet we hope the day is not far distant when so important an object may be carried into effect.

The plates of the 'Popular Economic Botany' (coloured) are of a very high character, though we should have been better pleased if the authorities, whence the majority of them are copied, were given. The correctness of some of the botanical information may be questioned: any errors of the kind may easily be corrected in a future edition, which we cannot doubt will soon be called for. It is with such an object, and not for the sake of finding fault, that we note as follows. It is remarked at p. 24, in speaking of the varieties of "Raisins or dried Grapes," that "some are stoneless, presenting the curious anomaly of a true fruit being perfected without seed;" and again, "this, although in the first instance only an accidental variety, yet is capable of being propagated and rendered permanent." Without seed, it cannot assuredly be called perfect; and the propagation can only be by grafts or cuttings, as so many varieties of other plants are increased.—The *Date Palm* (p. 81) does not belong to the Linnæan "*Order*," but to the *Class* "Diœcia."—We cannot but doubt the "*on dit*" of the monkeys in South America, who, when pelted with stones and missiles, are the means of supplying our markets with Brazil-nuts, "by hurling the great capsules, as big as cannon-balls, at their human opponents." *Salep* (p. 85) is assuredly prepared from the tuberous roots of many Orchidaceous plants besides those of *Eulophia campestris* of Cashmire. *Manna-croup* (p. 80) is generally considered to be the seeds of *Festuca*

fluitans. The *Cinnamon* (p. 90) can scarcely be said to resemble the "common Laurel (*Cerasus Laurocerasus*) very much:" the resemblance is as great (more so in the flowers) to the common *Sweet Bay*, which is a kind of *Laurel*, and fragrant too, as so many of the Laurels are.—In the *Sassafras-nuts* (p. 94) it cannot be the mark of the embryo indented on the cotyledons, but the radicle or plumule, or both, —for the cotyledons are part of the embryo. In the Turkish collection of Raw Produce at the Great Exhibition, a curious seed, "Kenguel" (p. 133), was shown as roasted and used like Coffee. "They were the seeds of a species of *Gumillea* (Nat. Ord. *Cunoniaceæ*)." What we saw under that name in that collection were assuredly the seeds of a Compositous plant, *Gundelia, G. Tournefortii.*—The *East India Madder* (*Rubia Munjista*), p. 211, is as much one of the *Galiaceæ* (not the group "*Cinchonaceæ*") as the *Rubia tinctorum* (see p. 209): it would be very strange if it were not.—*Saffron* (p. 217) is not the dried "*pistils*" of the common *Crocus* (*Crocus sativus*), but the dried *stigmas* and part of the *style*. At Tab. XIII., both in the plate and in the description, fig. 69 is erroneously called "*Orchella-weed,*" and fig. 70 the *Cudbear*: the reverse is the fact.—*Thus*, or Frankincense, is said to be the turpentine of *Abies resinæ*: an error probably originating in a synonym of the Frankincense given in Dr. Pereira's Materia Medica, "*Abietis resina*" (resin of Spruce); "spontaneous exudation (Dr. Pereira continues) of *Abies excelsa*."—Singapore "*Vegetable Tallow*" is said (p. 280) to be obtained from the fruit of some plants of the Natural Order *Dipteraceæ* (*Dipterocarpeæ?*).—*Rice-paper* "is now decided by the officers of Kew Gardens (p. 295) to be the produce of *Aralia papyrifera* (Nat. Ord. *Araliaceæ*), called in China *Taccada*." The *Taccada*, a plant of the Malay Archipelago, is a *Scævola, S. Taccada*, Roxb. (probably not distinct from *S. Königii*), of the Nat. Ord. *Goodenovieæ*. The pith is said "to be pared in the same way the ancients employed in preparing their pithy stem of the Papyrus Rush (*Papyrus antiquorum*):" is there any authority for such a statement?—*Jak* or *Jack-wood* (p. 331) is called, properly enough, *Artocarpus integrifolia*, but said to be "from the Breadfruit-tree," which is *Artocarpus incisa*. *Cocus* or *Kokka*, *Lepidostachys Roxburgii*, is an East Indian wood, not "from Cuba and the West Indian Islands." Notwithstanding the above criticisms, we are sure Mr. Archer has rendered good service to the cause of Economic Botany by the publication of this volume.

Notes on two little-known Genera connected with the South American Flora; *by* George Bentham, Esq.

Tapura, *Aubl.* (Nat. Ord. *Chailletiaceæ.*)

The small Order of *Chailletiaceæ* was established by Brown in his appendix to Tuckey's Congo, founded on De Candolle's genus *Chailletia*, with which he united *Leucosia* and *Dichapetalum* of Dupetit-Thouars, and associated in the same family *Tapura* of Aublet and an Indian genus since published by Roxburgh under the name of *Moacurra*. As however this Indian species and several African ones were then only indicated by Brown, not described or even named, the Order was, at the time of the publication of De Candolle's Prodromus, limited to seven species, viz. two from tropical America, two from tropical Africa, two from Madagascar, and one from Timor. This number has now increased to about twenty-six species more or less known, of which ten are from tropical America, seven from tropical Africa, one from South Africa, two from Madagascar, and five or six from East India and the Eastern Archipelago*. These species are distributed into four genera: *Chailletia*, the most numerous in species, is represented in the three tropical continents, *Moacurra* is entirely East Indian, and *Tapura* and *Stephanopodium* are confined to South America.

The position of the *Chailletiaceæ* next to *Celastraceæ* and *Aquifoliaceæ*, alluded to in the Niger Flora, p. 279, and in some modern general works, has been further confirmed by the observations of Miers (Contrib. p. 51), and may now be considered as generally admitted.

Of the four genera above mentioned, *Chailletia* and *Moacurra* have regular flowers, with five distant bifid petals and five stamens, all antheriferous, and are distinguished by the fruit, which is drupaceous in *Chailletia* and capsular in *Moacurra*. *Tapura* and *Stephanopodium* are monopetalous or rather gamopetalous, and more or less irregular, *Ta-*

* No. 9016, from Singapore, of Wallich's Catalogue appears to be identical with *Chailletia Timorensis*, DC.; Griffith gathered fine specimens of a much more tomentose variety (or species?) in Malacca; Wallich's n. 4038 from Tavoy is very near to both, but almost glabrous. Cuming's n. 1788 and 1192 from the Philippines are nearly allied, but differ in the shape and indumentum of the leaves, and in some other respects, and probably constitute one or perhaps two distinct species. There are also two species from Ceylon and one from Malacca, coming nearer in habit to the *Moacurra gelonioides*, but which, for want of the fruit, I am unable at present to determine with certainty.

pura having two bifid or doubly concave lobes and three narrow entire ones with three fertile and two sterile stamens, whilst *Stephanopodium* is said to have five entire flat lobes to the corolla and five fertile stamens; this plant however is only known to me from Pœppig's figure and description, and seems to require further investigation.

The genus *Tapura*, which is more especially the subject of the present observations, although several times figured, does not appear to have been very accurately described. In examining Mr. Spruce's species for distribution, I observed that the two large divisions of the corolla were deeply two-lobed, each lobe being remarkably hood-shaped and enclosing the fertile anthers in the bud, and as I observed no indication of that form in the published descriptions of the other species, I gave to this one the name of *T. cucullata*. I have since ascertained that this structure is in a great measure common to all the species of the genus, but as it appears to be more strongly marked in this one, I have retained the specific name under which it is distributed.

The perigynous glands of *Chailletia* are, in *Tapura*, represented by a semiannular disc, either entire and enclosing at least half the ovary, or more or less divided into two or three lobes or glands opposite the divisions of the corolla, but always unilateral and incomplete. This disc and the bilobed *biconcave* divisions of the corolla are accurately drawn in Sir W. Hooker's figure (Icones, t. 466) of *T. ciliata*, although neither are alluded to in Gardner's accompanying description.

The ovary is like that of *Chailletia*, with two collaterally pendulous ovules in each cell; it is trilocular in all the species known to me, with a long filiform style shortly divided at the top into three oblique or recurved stigmatic lobes; but Pœppig describes a bicarpellary species unknown to me, which however he only found in fruit.

The detailed technical character of Tapura may be given as follows:—

Calyx profunde 5-fidus, laciniis ovatis concavis inæqualibus, æstivatione valde imbricatis, interioribus majoribus. *Corolla* gamopetala, irregularis, quinquefida, lobis æstivatione imbricatis; tres exteriores angusti, integri, interdum alte coaliti, 2 interiores lati, emarginati v. bifidi, lobis cucullato-concavis antheras fertiles in alabastro foventibus. *Stamina* versus apicem tubi corollæ inserta et intra tubum decurrentia, 3 fertilia cum lobis corollæ majoribus alternantia exserta, 2 ananthera v. effœta inter lobos minores corollæ sita. *Discus* perigy-

nus unilateralis, incompletus, semiannulatus v. 2–3-divisus. *Ovarium* sessile, depresso-globosum, villosum, 3- (rarius 2-) loculare. *Ovula* in loculis gemina, ab apice collateraliter pendula. *Stylus* filiformis, apice 3- (2-) lobus, lobis subulato-clavatis stigmatosis sæpius obliquis v. recurvis. *Fructus* drupaceus (maturum non vidi).—*Frutices* Americæ tropicæ. *Stipulæ* parvæ, subpersistentes. *Folia* alterna, integerrima, coriacea. *Flores* ad apicem petioli glomerati (pedunculo petiolo adnato). *Bracteæ* minutæ, squamæformes.

The species known to me are the following:—

1. *T. Guianensis*, Aubl. Pl. Gui. vol. i. p. 126. t. 48?; foliis oblongo-ellipticis acuminatis glabris, floribus sessilibus, corollæ laciniis majoribus unguiculatis, exterioribus lineari-lanceolatis alte connatis.

The specimen I have examined is one from French Guiana from Sims's herbarium, which agrees so well with Aublet's figure as to the leaves and general habit, that I have no hesitation in referring it to his species, notwithstanding some discrepancies in the flowers as rudely represented in the plate. I find them to be sessile amongst the very small, persistent, scale-like bracts. The calyx is deeply divided into five (not six) divisions, of which the innermost are nearly twice the size of the exterior one. The corolla, about three lines long, is smooth outside and hairy inside, the divisions or petals are united into a complete tube to near half their length, the three entire ones slightly overlapping the two others in the bud; these two broad inner lobes are, as represented by Aublet, much shorter than the others, but are emarginate and bicucullate as in other species, and narrowed into a claw nearly as long as themselves; the three outer ones are united into a lip as stated by Aublet, but that lip is not merely tricrenate, but divided into three linear-lanceolate lobes. The stamens are inserted at the base of the lobes, but the three larger fertile ones can, on splitting the tube, easily be separated from it, which accounts for Aublet's representing one of them as inserted in the base of the corolla. The disc is much smaller than in *T. ciliata*, and, in the flower I opened, was divided into two ovate glands opposite to the inner petals.

2. *T. latifolia*, sp. n.; foliis ovali-ellipticis acuminatis glabris, floribus breviter pedicellatis, corollæ lobis omnibus unguiculatis subæquilongis, exterioribus oblique lanceolatis.

My specimens are from Forsyth's herbarium. I found them in a collection of Patagonian plants given to Forsyth by Captain Middleton;

they had not however, like most of the specimens of that collection, any label indicative of the station, and may possibly have been from tropical America. The leaf is much broader than in *T. Guianensis*, and the flowers are of the shape and size of those of *T. ciliata*, but borne on pedicels usually half a line long and much less hairy than in that species. The lobes of the corolla are all contracted at the base into claws nearly as long as themselves, the broad inner emarginate bicucullate petals are like those of *T. Guianensis*, the narrow outer ones free, as low as the inner ones, shaped as in *T. ciliata*, but the laminæ broader at the base. The disc is unilateral and entire, but smaller than in *T. ciliata*.

3. *T. ciliata*, Gardn. in Hook. Ic. t. 466; foliis oblongis obovatisve obtusis supra glabris subtus præsertim ad margines costamque dense sericeo-villosis, floribus subsessilibus, corollæ lobis subæquilongis vix brevissime unguiculatis, exterioribus lanceolato-linearibus.

Found by Mr. Gardner in the province of Goyaz in Brazil. His specimens (n. 3087) are very satisfactory, and have enabled me to dissect more flowers than of any other species of the genus. I find the details given in the above-quoted plate very correct, except perhaps that the narrow entire lobes are abruptly narrowed at the base, especially on one side, and the calycine lobes are more unequal than they are represented in the plate.

4. *T. cucullata*, sp. n.; foliis elongato-oblongis acuminatis glabris, floribus sessilibus, corollæ tubo brevissimo, lobis subæquilongis sessilibus, exterioribus lanceolato-oblongis.—*Arbor* gracilis, 20-pedalis. *Folia* 6–8 poll. longa, 2 poll. lata, oblique et obtuse acuminata, coriacea, reticulato-venosa, glabra, petiolo 4–6 lin. longo. *Flores* ad apicem petioli densissime glomerati, sessiles, puberuli, virides, bracteis parvis intermixti, in specimine vix perfecte evoluti. *Sepala* inæqualia, interiora corollam æquantia. *Corollæ* tubus brevior et lobi superiores profundius bifidi evidentiusque cucullati quam in cæteris speciebus, sed forte in flore perfectiore congeneribus similiores evadunt. *Stamina* basi breviter monadelpha, corollæ brevissime tantum adnata. *Discus* unilateralis, integer, ovario æquilongus. *Styli* lobi 3 reflexi.

A slender tree found by Mr. Spruce in the forest near San Gabriel on the Rio Negro. The leaves and inflorescence very much resemble those of *Stephanopodium Peruvianum* as figured by Pœppig, but the structure of the flowers is totally different.

5. *T. Amazonica*, Pœpp. et Endl. Nov. Gen. et Sp. vol. iii. p. 41; foliis ellipticis utrinque acutis subtus molliter hirsutis, drupa biloculari.

From the neighbourhood of Ega, on the Amazon. Unknown to me, and only seen in fruit by Pœppig.

The genus *Chailletia* now includes four American species, viz.—1. *C. pedunculata*, DC., which Schomburgk describes as a stout climber, his specimens (1st coll. n. 477) agreeing in every other respect with De Candolle's figure and description. 2. *C. latifolia*, Spruce, sp. n.; foliis amplis obovatis v. obovali-ellipticis supra glabris subtus ramulisque tomento minuto incanis, pedunculis dichotome corymbosis petiolo adnatis calycem æquantibus, floribus digynis.—*Folia* 6–9 poll. longa, 3–5 poll. lata, basi rotundato-cuneata, sæpe inæqualia, apice rotundato cum acumine brevissimo acuto. *Inflorescentia* et *flores C. pedunculatæ*, nisi cymæ densiores. *Sepala* ovata, extus tomentosa, æstivatione imbricata. *Petala* angusta, bifida, intus costa elevata percursa, lobis acutis concaviusculis, æstivatione leviter imbricata. *Squamæ perigynæ* parvæ, subintegræ. *Ovarium* villosissimum, biloculare, loculis biovulatis. *Styli* 2 breves.—A stout climber, with white flowers, of which Mr. Spruce found a single plant in the Capoeiras, near São Gabriel. 3. *C. vestita*, Spruce, described in vol. iii. of this Journal, p. 372, which, like *C. pedunculata*, appears to be sometimes a slender tree, sometimes a stout climber. 4. *C. Cubensis*, Pœpp. et Endl. Nov. Gen. et Sp. vol. iii. p. 41. Unknown to me.

LECOSTEMON, *Moç. et Sess.* (Nat. Ord. *Chrysobalanaceæ.*)

The number of new genera and species established in De Candolle's Prodromus, upon no other foundation than Moçino and Sessé's Mexican drawings, has been the subject of much animadversion; and as in many cases, after the lapse of many years, no specimens turned up in recent Mexican collections answering to the characters given, these have often been set down as hypothetical. It is astonishing however, in regard to genera at least, how numerous are the instances in which, when the plants themselves have at length found their way into our collections, they have proved the general accuracy of the Spanish artists' analysis, and the skill with which De Candolle has availed himself of them in drawing up his characters. Even where the original Mexican types have not been re-discovered, the validity of the generic groups has been frequently tested in South American congeners. On a former occasion I

took the opportunity of illustrating one of them, *Harpalyce*, by means of a species not uncommon in the Brazilian mining districts, my conclusions having been since confirmed by specimens of the Mexican species brought home by the late Dr. Coulter; and I now feel persuaded that I have identified another of them, *Lecostemon*, in four or perhaps five Brazilian and Cayenne species, all as yet unpublished, though one at least has been for near half a century in our herbaria. The Mexican type is however in this case still unknown to me.

Lecostemon was placed by De Candolle at the end of *Rosaceæ*, as a very doubtful associate, but, making allowance for some inaccuracies, easily accounted for in describing from a drawing, the most important discrepancies vanish, and the remaining characters not only leave no room for hesitation as to the identification of the genus, but place it most clearly among *Chrysobalanaceæ*, though as a very distinct genus, of which the following may be considered as an extended character:—

Calyx brevis, late cupulatus, dentibus 5 brevibus latis v. obsoletis. *Petala* 5, ad marginem disci calycem intus fere totum vestientis inserta, æstivatione imbricata, quinto intimo. *Stamina* numerosa, disco inordinate inserta; *filamenta* brevissima, persistentia; *antheræ* longe lineares, erectæ, basifixæ, caducæ. *Ovarium* sessile, globosum, glabrum, uniloculare. *Ovula* 2, erecta, inserta placentæ membranaceæ interdum fere in dissepimentum spurium expansæ. *Stylus* e basi ovarii adscendens, simplex, filiformis, acutus, hinc a basi v. a medio stigmatosus. *Drupa* parva, globosa, putamine crustaceo. *Semen* abortu unicum, reniformi-globosum, exalbuminosum, testa tenui, cotyledonibus crasso-carnosis fere conferruminatis, radicula parva inflexa ad hilum spectante.—*Frutices* Austro-Americani. *Folia* alterna, coriacea, integerrima. *Stipulæ* parvæ, subulatæ, v. obsoletæ. *Pedunculi* in axillis superioribus racemosi v. subpaniculati. *Bracteæ* et *bracteolæ* squamæformes. *Pedicelli* sub calyce incrassati, sæpe cernui, fructiferi cum calyce plus minus incrassato-carnosi. *Filamenta* post anthesin diu persistentia, supra calycis disciformis marginem subrecurva, fere glanduliformia. *Antheræ* uti petala caducissima.

From the above character that given by De Candolle differs chiefly in that he states the flowers to be apetalous; but a glance at the specimens will readily suggest that in a not very accurate drawing the petals might look like coloured petaloid deciduous lobes of the calyx. The ovary is also said to be "in stylum desinens," but this again is a

mistake not unlikely to occur from the appearance of the style, where there are no means of actually dissecting the flower.

The species known to me are:—

1. *L. Gardnerianum*; foliis (parvis) petiolatis oblongis obovatisve basi obtusiusculis, pedunculis folia subæquantibus 3-5-floris.—*Frutex* videtur, ramulis dense foliosis, novellis inflorescentiaque ferrugineis. *Stipulæ* subulatæ, deciduæ. *Folia* 1-1½-pollicaria, coriacea, integerrima, pleraque glandula v. callo terminata, petiolo 2-3 lin. longo. *Pedicelli* 2 lin. longi, apice incrassati. *Calycis* dentes brevissimi, lati, obtusi, petalis delapsis vix conspicui. *Petala* 2½-3 lin. longa, parum inæqualia, ovalia. *Stamina* 40-50, filamentis glanduliformibus post anthesin supra marginem calycis recurvis. *Ovarium* rufo-puberulum. *Stylus* 3 lin. longus, paullo infra medium dilatatus et usque ad apicem hinc stigmatosus.

Province of Piauhy, Brazil, *Gardner*, n. 2814. This, among the species known to me, must come the nearest to the original Mexican *L. terniflorum*.

2. *L. Amazonicum*, Spruce; foliis amplis obovali-oblongis basi in petiolum brevem angustatis, venis tenuibus, pedunculis axillaribus racemosis terminalique thyrsifero folio multo brevioribus, pedicello fructifero leviter incrassato.—*Frutex* biorgyalis, ramulis crassis, inflorescentia rubiginosa. *Stipulæ* obsoletæ. *Folia* 7-9 poll. longa, 2-3 poll. lata, breviter et obtuse acuminata v. obtusa, coriacea, supra nitida. *Racemi* v. thyrsi 3-5-pollicares. *Bracteæ* et bracteolæ latæ, squamæformes. *Pedicelli* floridi 3-4 lin. longi. *Calyx* junior late 5-dentatus, petalis delapsis truncatus, fructifer incrassato-carnosulus, hemisphæricus, pedicello recurvo leviter incrassato. *Petala* et stamina *L. Gardneriani*, nisi paullo majora. *Drupa* 4 lin. diametro.

In the sandy campos about Santarem, on the Amazon; a fine erect-growing shrub. *R. Spruce*.

3. *L. crassipes*, Spruce; foliis amplis oblongis obovatisve basi in petiolum longum angustatis, venis tenuibus, pedunculis axillaribus racemosis v. terminali thyrsifero foliis multo brevioribus, pedicello fructifero crassissimo carnoso.—*Arbor* 30-pedalis. *Folia* quoad formam iis *L. Amazonici* similia, sed firmiora et majora, sæpe ultrapedalia, 3-6 poll. lata, et longius petiolata. *Pedicelli* fructiferi rubiginosi, more fere *Anacardii* incrassato-carnosi, summo apice indurato-sublignosi, 5-6 lin. diametro. *Drupa* vix 4 lin. diametro.

Near Barra do Rio Negro, in the moist forest. *R. Spruce*.

β.? *Cayennense;* foliis angustis ultra pedem longis, 2–3 poll. latis.

Cayenne, *Martin.* I have only a single specimen, of which the fruit is not yet ripe; I am not sure therefore whether it may not prove to be a distinct species.

4. *L. macrophyllum*, Spruce; foliis breviter petiolatis amplis lanceolato-v. obovali-oblongis basi longe angustatis, venis arcuatis in nervum intramarginalem confluentibus, pedunculis fasciculatis racemosis folio multo brevioribus.—*Frutex* 12–20-pedalis, ramis nodosis. *Folia* majora fere sesquipedalia, obtusa, tenuiter coriacea, opaca, venis quam in præcedentibus evidentioribus. *Racemi* numerosi, 2–4-pollicares. *Pedicelli* breves. *Flores* præcedentis nisi petalis angustioribus. *Fructus* non vidi.

Near Barra do Rio Negro, in the Capoeiras, *R. Spruce.* This species may be very readily distinguished from the two preceding by the intra-marginal nerve, formed of the connection of the primary veins, and continuous nearly to the apex of the leaf, whilst there is scarcely ever any trace of it in the two other species. The pedicels are also much shorter, the calycine teeth scarcely prominent, even in the bud, and the petals narrower.

On a new Genus and some new Species of TASMANIAN PLANTS; *by* J. D. HOOKER, M.D., F.R.S., etc. With three Plates.

I. MILLIGANIA*, *Hook. fil.* (Nat. Ord. *Liliaceæ.*)

Perianthium persistens, patens, fere ad basin hemisphæricum, 6- (rarius 5–7-) partitum, segmentis imbricatis. *Stamina* 6, parva, segmentis inserta; *filamentis* brevibus subulatis; *antheris* introrsis versatilibus 2-locularibus, polline subgloboso. *Ovarium* oblongum, basi perianthio immersum et eo adhærens, 3-loculare. *Styli* 3, discreti, subulati, recurvi; *stigmata* punctiformia; *ovula* plurima, angulo interiori affixa, ascendentia, anatropa. *Capsula* oblonga, obtusa, profunde triloba, chartaceo-membranacea, ad medium tripartibilis, loculis (stylis fissis terminatis) superne breviter loculicide dehiscentibus. *Semina* plurima v. abortu pauca, ascendentia, linearia, curva; *testa*

* *Milligania*, mihi, in Hook. Ic. Plant. t. 299, does not differ generically from *Gunnera* and *Dysemone*, Banks et Sol. I have to express my regret for the inadvertence which led to my considering that plant as a new genus; and at the same time my gratification at being enabled to dedicate the present far more interesting genus to one of the most indefatigable and able of Tasmanian botanists.

crustacea, atra, nitida, utrinque subcarunculata v. apice appendiculata; *endopleura* membranacea; *albumine* carnoso; *embryone* tereti axillari.—Herbæ *elatæ cæspitosæ Tasmanicæ, facie* Asteliæ, *sericeæ v. villosæ.* Radix *fibrosa, fibris crassis.* Folia *lineari-ensiformia, sicca coriacea.* Scapus *paniculatus, ramosus, bracteatus.* Flores *pedicellati, mediocres, albi, bracteolati.* Capsula *Anguillariæ.*

1. Milligania *longifolia;* foliis elongato-linearibus subgramineis basi parce villosis, panicula laxa effusa ramis gracilibus, bracteis bracteolisque membranaceis linearibus lineari-lanceolatisve. (Tab. IX.)

HAB. Tasmania. Franklin River, under shade of Huon Pines, February, 1845; *Gunn*, 1388. Crevices of limestone cliffs, Gordon's River, M'Quarrie Harbour, December, 1846; *Milligan*, 749.

Mr. Gunn, who discovered this genus and species, states that it grew in company with some of the most peculiar plants of Tasmania; the Huon Pine, *Anopterus glandulosus, Cenarrenes nitida*, and *Richea pandanifolia*, all of which are typical of a most humid atmosphere. It so closely resembles *Astelia alpina* in habit and general appearance, that its discoverer took it for that plant; and he adds that the specimens were nearly three months drying between papers that were daily changed.—*Plants* apparently growing in dense large tufts, with long pendulous spreading foliage and erect scapes. *Roots* of stout, simple fibres. *Stems* of large plants nearly 2 inches in diameter at the base, formed of the sheathing bases of the leaves, which are surrounded by the fibres of decayed foliage. *Leaves* shorter or longer than the scape, 1–3 feet long, $\frac{1}{2}$–2 inches broad, linear, gradually tapering at the top to a long point, grassy-green, ribbed when dry, more or less silky or villous towards the base and along the midrib. *Scape* villous, 1–2 feet high, branched above the middle, bearing below that one or two narrow linear subulate amplexicaul leaves. *Panicle* bracteate at the axils; bracteæ lanceolate or linear-lanceolate, generally elongate; branches slender, spreading; pedicels slender, cernuous, covered with silky wool, bearing small linear membranous bracteolæ at the base. *Flowers* $\frac{1}{3}$ inch broad, white, not jointed on to the pedicel. *Perianth* entire and cup-shaped at the base, then divided into six (rarely five or seven) linear-oblong blunt lobes, that are imbricate and somewhat involute in æstivation. *Stamens* small, inserted at the base of the segments; filaments subulate. *Anthers* small, versatile, two-lobed. *Ovary* sunk in the base of the perianth, and adherent at its base with it, oblong,

three-lobed, with three subulate recurved stigmas, three-celled, with many axile ascending ovules. *Capsule* oblong, membranous, three-lobed, three-celled, dehiscing to the middle down the axis, each cell splitting at the summit only, the divisions crowned by the persistent styles, which are also split in halves. *Seeds* few or many, linear, ascending, covered with a brittle black shining testa, that is contracted at either end of the seed.—In small specimens the leaves are a span long and $\frac{1}{4}$–$\frac{1}{2}$ inch broad.

PLATE IX. Figs. 1 and 2. Flowers. 3. Ovary. 4. Transverse section of ovary. 5. Capsule. 6. Vertical section of capsule. 7. Seed. 8. The same cut longitudinally:—*all magnified.*

2. Milligania *densiflora;* foliis coriaceis patulis e basi lata vaginante gradatim angustatis acuminatis late subulato-lanceolatis lineari-subulatisve sparse sericeo-pilosis, scapo robusto sericeo-villoso, bracteis ovato-lanceolatis concavis longe acuminatis infimo basi longe amplexicauli vaginante vagina integra membranacea, panicula ovata densiflora ramis ramulisque robustis.

HAB. Tasmania. Mount Sorell, M'Quarrie Harbour. December, 1846. *Dr. Milligan.*

A very different-looking plant from the preceding, with much shorter, more coriaceous foliage, sheathing lower bracts, robust scape, broader bractlets, and dense panicle.—*Leaves* coriaceous, 8–10 inches long, gradually tapering from a broad sheathing base, 1–1$\frac{1}{2}$ inch broad, to an acuminate point, sparingly covered with silky hairs. *Scape* woolly with silky hairs, robust, with one or two large ovate concave leafy bracts, that have long entire amplexicaul sheaths and tapering apices. *Panicle* 1–6 inches long; branches short, with concave leafy bracts; flowers crowded, $\frac{1}{2}$ inch across, white.

This curious genus is apparently intermediate between *Liliaceæ* and *Melanthaceæ*, differing from the former in the three separate styles and the partially tripartible capsule, and from the latter in the more important characters of versatile introrse anthers, and few linear seeds covered with a black brittle testa. Its general resemblance to *Astelia* I have already mentioned, and it further agrees with that genus in the nature of the silky wool, the very coriaceous foliage, the hemispherical base of the perianth, oblong capsule, and especially in the long seed. It differs from that genus in the structure and dehiscence of the capsule, which resembles in form, etc., that of *Anguillaria.* So much diversity

exists however in the form, placentation, and dehiscence of the fruit in *Astelia*, that much stress cannot be laid upon that organ; and though the affinities of both *Milligania* and *Astelia* are so obscure, I regard them as nearly allied to one another, and both as members of the *Asphodeleæ*.

II. Thryptomene, *Endl.*

1. Thryptomene *micrantha;* glaberrima, ramulis gracilibus virgatis, foliis lineari-obovatis obtusis obscure unicostatis grosse punctatis, floribus parvis ternis in pedunculo brevissimo axillari sessilibus, ovario obconico, petalis lobis calycinis rotundatis minoribus, staminibus 5. (Tab. VIII.)

Hab. Tasmania; Schouten Island in Bass's Straits, on banks of sand and oyster-shells; *R. C. Gunn, Esq.* (*n.* 2042.) April, 1848.

Although differing from all described species of the genus (of which there are four or five natives of Southern and Western Australia), I have not hesitated to bring this curious little plant under Endlicher's genus *Thryptomene*, with which in every other respect it perfectly agrees. It forms a small twiggy bush, with slender branchlets, covered with little opposite leaves and bears minute axillary white flowers. *Branchlets* obscurely four-angled, covered with pale bark. *Leaves* rather crowded, suberect or patent, $\frac{1}{4}$–$\frac{1}{3}$ inch long, thick and coriaceous, very shortly petioled, linear-obovate, blunt, covered with large dots. *Peduncles* very short, bearing one to three sessile flowers. *Calyx* 1 line long, obconic, ten-ribbed, with two minute deciduous bracts at the base; lobes five, orbicular. *Petals* smaller than the calyx-lobes, of the same form, white, persistent. *Stamens* five, with short, subulate, incurved filaments, and didymous anthers with a thickened connective; cells bursting transversely. *Style* short. *Ovary* with one small cell towards the top, containing two very minute collateral ovules, attached to a small placenta near the base of the cell.

Plate VIII. Fig. 1. Leaf. 2. Peduncle and flowers. 3. Flower. 4. Vertical section of the same. 5. Transverse section of ovary. 6 and 7. Stamens:—*all magnified.*

III. Drapetes, *Forst.*

1. Drapetes *Tasmanica;* cæspitosa, caulibus prostratis crassiusculis ramosis, ramulis glabris, foliis imbricatis appressis lineari-oblongis obtusis longe ciliatis dorso apice sericeo-barbatis concavis nervosis,

perianthii tubo cylindraceo sericeo lobis lanceolatis ciliatis glandulis fauce 8 per paria approximatis globosis, filamentis inter segmenta insertis filiformi-subulatis, stigmate capitato glanduloso, bacca ovoidea obtusa compressa, semine loculo conformi testa crustacea atra nitida. (TAB. VII.)

HAB. Summit of the Western Mountains in Tasmania, alt. 3–4000 feet; *R. C. Gunn, Esq.*

The discovery of the genus *Drapetes* on the Alps of Tasmania by our indefatigable correspondent Mr. Gunn, is a very interesting though hardly unexpected one. It belongs to a small group of plants confined to the high southern latitudes or to great elevations in warmer regions of the Southern Hemisphere; and it is found in both the Old and New World. Ten years ago only one species was known, the *D. muscosa* of Forster, a native of Fuegia and the Falkland Islands. Since that period four more species have been discovered, *D. Dieffenbachii*, Hook. Lond. Journ. Bot. vol. ii. p. 497. t. 17, and *D. muscoides*, both in New Zealand (see Flora Novæ Zelandiæ); one on the lofty mountain of Kini Balu in Borneo, *D. ericoides*, nob. in Hook. Ic. Plant. t. 895; and lastly the present.

All the species of *Drapetes* very closely resemble one another, and form a natural genus; and one character alone of some importance distinguishes the American species (*D. muscosa*) from those of the Old World, which is the jointing of the tube of the perianth above the ovary, whence the upper part falls away as the flower withers. I indicated this and some other points of difference between the South American and New Zealand species in the 'Flora Antarctica,' and suggested the probability of these being considered of generic importance by some botanists. They have since then been so regarded by the late Professor Endlicher, who proposed the name *Kelleria* for the New Zealand *D. Dieffenbachii*, characterizing it by the continuous tube of the perianth, capitate stigma, and broad gland opposite each segment of the perianth; these characters are common to the Bornean and Tasmanian plants, except that the gland is divided, or rather there is a pair of these organs, in both the latter species.

PLATE VII. Fig. 1. Leaf. 2. Flower. 3. Stamens and glands. 4. Ovary. 5. The same cut open. 6 and 7. Fruit. 8. The same cut open, showing the seed. 9. Embryo:—*all magnified.*

Von Martius *on* Stove Cultivation.

The following aphoristic summary of Professor von Martius's *Remarks on the scientific objects and the utility of Plant Houses*, addressed, in fourteen letters, to the editor of 'Flora,' we think not unsuited to a Kew Garden Miscellany. The memoir *in extenso*, though full of interest, is beyond our scope and limits. Its title is

Bemerkungen über die wissenschaftliche Bestimmung und die Leistigungen unserer Gewächshäuser; von Hofrath Dr. von Martius, Vorstand und Conservator des kön. botanischen Gartens in München. In Briefen an den Herausgeber. Flora per 1853, n. 11, etc. (Separately printed, 126 pages.)*

1. First of all it is to be determined what plants are to be cultivated in a given Plant-house, or its separate parts. The more select the choice, the more judicious their grouping according to habits and culture, the easier and cheaper will be the execution of the structure, and the treatment of its contents.

2. The distinction between a Serre d'exhibition, "ein hohes Schauhaus" (large stove conservatory?) and a low stove, "ein niedrigeres Gewächshaus," must be kept rigidly in view, according to their different requirements; and it is preferable, accordingly, as regards economy and management, to have two separate buildings, instead of one, for accomplishing the objects in contemplation. Plants of low and humble growth should be banished from a large building destined chiefly for trees and tall shrubs, and placed in one of suitable elevation.

3. In the construction of a Stove-Conservatory, it is an important consideration, whether the intention is to exhibit the growth and habit of its inmates, or chiefly their flowers and fruits.

4. In order to favour, in the greatest degree possible, the harmonious growth of the plants, to obtain a uniform development of branches and leaves, such a building must be capable of admitting light from all sides.

5. But this object may be attained in our climate, by admitting light to the North, from above, independent of its indispensable access from

* We are indebted to our friend Dr. Wallich for the translation of this important document, which, owing to the technical nature of many of its details, has been a work of much difficulty. Could its talented author, Dr. von Martius, visit any of those gardens in England, where first-rate tropical houses are managed by men of first-rate ability, we think he would find reason to alter his opinion very materially on many of the points he discusses.—Ed.

the South, and also the East and West; for, reflected light acts more powerfully than direct, the greater the angle of incidence of its rays.

6. If it is found desirable to apply glass extensively on the north-side, this important result will be attained, that it will contribute towards maintaining as uniform a degree of heat within as possible (by preventing its accumulation in the higher strata of air), and promoting transversal currents.

7. In both the one and the other description of buildings, it is particularly to be attended to, that shade-plants are kept entirely apart from others; if in the same house, they require distinct treatment.

8. The plants which belong to the Stove-Conservatory are those, peculiar to the forest vegetation, both the loftiest and ordinary, of their native country; and as the denseness of a forest impedes the full development of its trees, so does the same happen in a crowded house. Hence the area must be proportionate to the production of branches and leaves. That those structures are in many cases overloaded with plants, is proved by the practice of removing many of these out of doors, into the open air, in summer; the remnant being mostly numerous enough to occupy the entire space, without preventing commodious access.

9. The more spacious the building is, the greater opportunity does it afford, for cultivating also plants which thrive under considerable privation of light; that is to say, such of these, as are kept irrespectively of their flowering, or which may be accommodated with light at that particular period, or else are accustomed to blossom in the shade.

10. The organization of trees fits them in a greater degree than plants of lower stature, to have the loss of light compensated by an increase of temperature in the soil; and they demand, accordingly, especial care in that respect during the season of the year, when the scanty supply of light indicates a judicious and cautious increase of bottom-heat in the building.

11. Since the forest-vegetation is, on the whole, more dependent on periodical light, than the ground-vegetation, it follows, that we must employ a variety and complication of appliances, in order to modify the effect of light and shade, which are less indispensable in the low houses (propagating stoves) where herbaceous and the like plants are chiefly and extensively cultivated.

12. These last-mentioned buildings and plants ought to have as

much as possible continuous daylight, in conformity to what takes place in their natural place of growth; whereas

13. The lower forest-vegetation demands a strong degree of direct light, and if equinoctial, or from hot tropical countries, a long-continued and uniform increase of heat.

14. The ground-vegetation of various tropical and subtropical regions are subject, sometimes, to a very considerable reduction of temperature, owing to the powerful nocturnal radiation of heat; so that plants from thence, should be carefully separated from those, which are impatient of any considerable diminution of temperature. It is in this respect that mountain-plants from the tropics, will bear being associated with those of subtropical regions.

15. As far as it is practicable, such plants only, as agree in their periods of vegetation, should be associated together in any description of house; especially in those cases, where the transition from one vital period into another, is very energetic, and where the state of rest is in consequence strongly marked. In short, plants of very different periodicity, should always be kept apart from each other.

16. In the reconstruction or arrangement of houses, the productions of one and the same native country ought, wherever possible, to be assembled together. It is advantageous to go beyond even the common classification of Cape of Good Hope houses, New Holland houses, etc., and to establish single floral regions, in separate buildings, or divisions of them.

17. Whenever it is required to subdivide and accommodate a house for different cultures, those plants, which are nearest allied in their life-periods, ought to be grouped together; while others, which differ greatly in that point, should be kept farthest remote from each other.

18. In selecting the proper site in a given locality, the first consideration should be, whether the intended building admits of being erected at right angles to the meridian, or at what declination from it; and consequently, what light can be obtained at certain times of the year, or the day. So likewise must attention be paid, to the peculiarities of the climate in which the garden is situated, in apportioning the different localities in the building itself. Under this head comes especially the direction of the prevailing winds at different seasons, by which the temperature of one or the other aspect of the house may become particularly lowered.

19. According to the nature of the plants in the house and its subdivisions, the amount of moisture given to them by various contrivances must be regulated. The antiquated terms *hot and moist*, *hot and dry*, *cold and moist*, *cold and dry*, find an application here to some extent; for example, plants from dry places require being heated exclusively by means of hot air conveyed in pipes; while others are best suited by tubes conveying hot water, or by a regulated admission of warm vapours. On these important differences depend the terms of *dry* and *damp* stoves (to which latter belong those for *Orchideæ*); but as we become nearer acquainted with the wants of certain families and floras, according to the degree and periodicity of a variety of influences, we shall have to proceed further in these subdivisions; and this points out, that the cultivation of *Orchideæ*, *Ferns*, *Bromeliaceæ*, *Aroideæ*, *Scitamineæ*, etc. ought, as far as practicable, to be kept asunder.

20. The ventilation of the building is another point of great weight; for free air furnishes not only the *pabulum vitæ* to plants, causing the manifold internal movements of vegetation; but it promotes the act of impregnation, among others by the aid of small insects. The cultivator has moreover the power of adding certain gases to the atmosphere in the house, which may serve, under certain circumstances, to promote vegetation.

21. Aquatic plants being, with few exceptions, of humble stature, their cultivation belongs properly to low stoves. Some kinds of a taller growth might be suitably provided for in conservatory stoves by placing them round fountains or artificial cascades. They will however attain their greatest perfection in stoves especially devoted to their culture, and heated by hot water.

On three new Genera connected with the INDIAN FLORA; *by* GEORGE BENTHAM, ESQ.

I. STOCKSIA. (Nat. Ord. *Sapindaceæ.*)

The fine collection of plants made by Dr. J. E. Stocks in Upper Beloochistan in April and May, 1850, has already supplied materials for some interesting papers by that zealous botanist in the former volumes of this Journal, and he is now preparing a general catalogue of all his

collections from Beloochistan and Scinde. In the meantime he has transmitted to me for examination some of the more remarkable species, and, amongst others, what appears to be a perfectly new form of *Sapindaceæ*. As I have his full permission to publish any of his plants, I gladly avail myself of it to dedicate this genus to one who promises to hold so distinguished a place among the investigators of Indian Botany.

In outward appearance this prickly, almost leafless shrub, assumes the rigid, divaricately-branched, scraggy form of so many of the vegetable productions of those arid table-lands. Without the flowers one might take it for a very thorny *Lycium*, but it is polypetalous, and amongst these the hypogynous disc, the imbricated sepals, the hairy tuft at the base of the petals, the vacancy left by the deficient fifth one, a certain obliquity in the flower, and the three-celled ovary, at once point to *Sapindaceæ*, showing a close affinity to *Paullinia* and its nearest allies; whilst the simple leaves and the geminate, not solitary, ovules in each cell refer it to the tribe of *Dodoneæ*. The fruit is indeed as yet wanting to complete the history of the genus, but we have quite sufficient to give it a distinct character, and to fix its affinities. Dr. Stocks gathered the plant on the 26th March, at Galangon in the high plains of Upper Beloochistan, at an elevation above the sea of about 5127 feet.

The following are the technical botanical characters:—

Char. Gen. STOCKSIA. *Sepala* 5, orbiculata, æstivatione valde imbricata. *Petala* 4, versus marginem disci hypogyni inserta, æstivatione imbricata, basi fasciculo denso pilorum appendiculata, quinti superioris sede vacua. *Stamina* 8, subexcentrica, disco inter petala et ovarium inserta, filamentis filiformibus, antheris ovatis bilocularibus. *Ovarium* triloculare, quandoque abortivum, sessile. *Ovula* in loculis gemina, in medio anguli centralis collateraliter affixa. *Stylus* incurvus, apice attenuato minute stigmatosus.—Frutex *foliis simplicibus*.

Species unica: *S. Brahuica*.—*Frutex* glaberrimus, glaucescens, divaricato-ramosissimus, ramulis spinescentibus horridus. *Ramuli* novelli rubescentes. *Folia* pauca, hinc inde ramulis abortientibus fasciculata, alterna, linearia, obtusa, basi in petiolum brevissimum contracta, $\frac{1}{4}$–1 poll. longa, 1 lin. lata, pallide virentia, costa vix conspicua, cæterum enervia. *Pedunculi* racemosim 1–3-flori, ad nodos fasciculati,

vix semipollicares. *Bracteolæ* sub pedicellis vel ad articulationem pedunculi uniflori parvæ, deciduæ. *Pedicelli* 1–2 lin. longi, ebracteolati. *Sepala* $1\frac{3}{4}$ lin. longa, orbiculato-concava, minute ciliolata. *Petala* calyci subæqualia v. minora, elliptica, obtusa; quintum forte nonnunquam adest cæteris multo minus, ego tamen sedem semper vacuam vidi. *Discus* pulviniformis, carnosus, medio depressus. *Stamina* corolla duplo longiora; filamenta filiformia, basi extus longe pilosa, cæterum glabra; antherarum loculi longitudinaliter dehiscentes. *Ovarium* triquetrum, acutum, in floribus pluribus submasculis parvum et arbortivum, in fertilibus petalis vix brevius. *Fructus* non vidi.

STRACHEYA. (Nat. Ord. *Leguminosæ-Papilionaceæ.*)

Next to the polyandrous *Megacarpæa*, and to a singular little alpine plant which may be a very much reduced or possibly an abnormal state of a *Ranunculacea*, this new *Leguminosa* is perhaps the most curious among the numerous plants collected in the mountains of North India, by Messrs. Strachey and Winterbottom. Its general appearance and flowers are those of the stemless astragaloid *Hedysara*, but, as in *Eversmannia*, there is no trace of articulation in the pod; it is distinguished from the latter genus by its habit, and by the pods toothed on the edges like those of *Biserrula*, besides being more or less echinate along the centre of the broad sides. It must be placed next to *Eversmannia*, with a close natural affinity to *Hedysarum*, although in our present somewhat artificial arrangement both genera rank amongst *Galegeæ*. I have great pleasure in dedicating this genus to the distinguished traveller who first discovered it in the mountains of the Tibetan frontier, Captain Richard Strachey, in commemoration of the services he has rendered to Indian Botany during his survey of the mountains of Kamaon and adjoining districts, and of the liberality with which, under the sanction of the Court of Directors, he has, in conjunction with Mr. Winterbottom, distributed their conjoined valuable collections so as to render them available for the purposes of science. The species has evidently a wide geographical range in the Tibetan mountains, as Dr. Thomson gathered it at the Lanak Pass in Western Tibet and Dr. Hooker in Northern Sikkim, always at an elevation of 15,000 feet and upwards, above the level of the sea.

Char. Gen. STRACHEYA. *Calyx* bibracteolatus, dentibus 5 elongatis subbilabiatus. *Corollæ* vexillum obovatum, carinam oblique trunca-

tam æquans, alis angustis brevioribus. *Stamina* diadelpha, apice abrupte infracta, filamento vexillari a basi recto. *Ovarium* sessile, pauci-ovulatum. *Legumen* exsertum, continuum, plano-compressum, indehiscens, transverse reticulatum, suturis sinuatis spinoso-dentatis, faciebus aculeis compressis longitudinaliter auctis.—*Herba* suffruticosa, cæspitosa, habitu et floribus *Hedysaris* subacaulibus similis, legumine distincto, *Eversmanniæ* affinis.

Species unica: *S. Tibetica.*—*Caules* brevissimi, dense cæspitoso-ramosi, ramis rarius subelongatis 1–1½-pollicaribus. *Stipulæ* scariosæ, lato-ovatæ, 2–3 lin. longæ, obtusiusculæ, postice connatæ, adpresse pubescentes. *Folia* pinnata. *Petiolus* communis 1½–2-pollicaris, complanatus, adpresse pubescens. *Foliola* 8–10-juga, ovata v. oblonga, obtusa, 3–6 lin. longa, supra glabra, subtus plus minus adpresse pilosa. *Racemi* 1–4-flori, intra folia subsessiles, rachi pedicellisque sæpius calyce brevioribus. *Bracteæ* lanceolatæ, subscariosæ, sericeo-pilosulæ; bracteolæ consimiles, calycis tubum subæquantes v. paullo longiores. *Calyx* anguste campanulatus, pilis adpressis pubescens, tubo 1½ lin., laciniis 2 lin. v. paullo longioribus inter se subæqualibus, 2 supremis tamen magis approximatis et interdum altius connatis. *Vexillum* 7 lin. longum, obovatum, emarginatum, basi in unguem latum contractum. *Alæ* anguste oblongæ, falcatæ, obtusæ, unguiculatæ, hinc obtuse auriculatæ, lateraliter supra medium intus gibbæ. *Carina* alis longior et pluries latior, vexillo vix brevior. *Ovarium* fere glabrum, ovulis circa 4. *Legumen* sessile, pollicare v. paullo longius, 3 lin. latum, tenuiter pubescens. *Aculei* marginis et facierum sæpe lineam longi, basi dilatati, faciales e venis transversis orti. *Semina* inter se distantia, reniformia, funiculo brevi estrophiolato.

CARLEMANNIA. (Nat. Ord. *Rubiaceæ-Hedyotideæ.*)

I find this plant in the herbarium of my late most valued friend Dr. Charles Lemann, whose zeal in the cause of botanical science is so well known to his numerous correspondents. Although he published but little, he had thoroughly investigated the botany of the island of Madeira, and liberally communicated the results of his labours on that and other floras, to all to whom they could be useful. During the latter years of his life, he devoted his time and his means to the formation of an extensive herbarium, which he continued to increase even after the

progress of his last fatal malady had taken from him all prospect of any further personal enjoyment. Some portions of this collection he kindly transferred to me before his decease, but the great bulk, amounting to about 30,000 species, has since then, in compliance with his wishes, been presented by his brother to the University of Cambridge. An important item in the herbarium, including the species I now describe, is composed of the Indian collections of his friend, the late Dr. Griffith, which gives me the opportunity of associating, in the name I propose, those of these two friends and botanists.

I consider the *Carlemannia Griffithii* as an undoubted *Rubiacea*, although it differs in two striking particulars from the great mass, if not from the whole, of that extensive Order. The leaves are serrately toothed, and the stamens are reduced to two in a tetramerous flower. At first sight the plant appears also to be exstipulate, but on a careful examination it will be found in the young shoots that the petioles are connected by a prominent line bearing occasionally a few minute teeth, and this line may even be traced on the old stems, although it becomes very faint. In all other respects the *Carlemannia* is a genuine *Hedyotidea*. In habit it resembles some species of *Ophiorrhiza*; in inflorescence and capsule it is near to some of the broad-leaved corymbose *Oldenlandiæ*. Dr. Griffith procured specimens from the neighbourhood of Darjeeling and gathered others from the Khasiya hills, and it has been since collected in both these localities by Drs. Hooker and Thomson.

Char. Gen. CARLEMANNIA. *Calycis* limbus 4-partitus. *Corollæ* tubus tenuis, limbus patens, lobis 4 æstivatione imbricata, uno exteriore paullo majore. *Stamina* 2, medio tubo inserta, inclusa; filamenta brevia; antheræ oblongæ, loculis parallelis distinctis. *Stylus* apice breviter bifidus, lobis crassiusculis intus planis stigmatosis. *Discus* epyginus annularis, brevis, subbipartitus. *Ovarium* biloculare. *Placentæ* e basi loculorum erectæ, multiovulatæ. *Capsula* globosa, calycis limbo coronata, membranacea, loculicide dehiscens, valvulis integris medio septiferis. *Semina* numerosa, parva, testa coriacea, membrana interna albumini adnata grosse reticulata. *Albumen* grosse granulatum. *Embryo* minutus, vix a granulis albuminis distinguendus.

Species unica: *Carlemannia Griffithii.*—*Herba* (bipedalis) glabra, opposite ramosa, ramis teretibus ad nodos flexuosis. *Stipulæ* ad lineam parum elevatam, interdum minute dentatam, petiolos connecten-

tem, reductæ. *Folia* opposita, petiolata, ovata v. ovato-lanceolata, longiuscule acuminata, margine serrato-crenata, basi rotundata v. cuneata, 2–3-pollicaria, membranacea, viridia, penninervia. *Cymæ* terminales v. in dichotomiis ramorum superiorum pedunculatæ, dichotomæ, floriferæ semipollicem, fructiferæ sesquipollicem latæ, multifloræ, ramulis ultimis pedicellisque alternis. *Bracteæ* parvæ, lineares. *Flores* circa 2 lin. longæ, glabræ. *Ovarium* globosum. *Calycis* lobi oblongi, inequales, tubo corollæ multo breviores. *Corollæ* laciniæ tubo suo multo breviores, lato-ovatæ, obtusæ, dorso sub apice gibbæ v. submucronatæ. *Capsulæ* virides, 2 lin. diametro, iis *Oldenlandiarum* simillimæ.

Description and Figure of a new FERN *from Malacca; by* SIR W. J. HOOKER, D.C.L., F.R.A. and L.S.

(TAB. XI.)

POLYPODIUM (Drynaria) LOBBIANUM, *Hook.*

Frondibus amplis glabris coriaceis nitidis flabelliformibus e basi repetitim (4–5-ties) profunde dichotomis, laciniis lineari-lanceolatis acuminatis integerrimis, costa centrali, soris utrinque subuniserialibus, stipite elongato fusco nudo.

HAB. Mount Ophir, *Mr. Thomas Lobb.*

This fine species of Fern seems, like the *Matonia*, to be peculiar to the locality just mentioned; at least I have seen nothing approaching to it from elsewhere, nor indeed am I aware that it has been gathered by any other collector than Mr. Lobb. At the first aspect, a resemblance to two Ferns of the Malayan Peninsula and Archipelago is discovered; namely, *Polypodium* (Dipteris) *Horsfieldii*, Br., and *P. Wallichii*, Hook. et Grev., especially in the flabellate and dichotomous ramification; to *P. Wallichii* still further in the capsules of the sori being "imbedded in a gum-like pulpy substance." Here however the similarity ceases. The venation differs considerably from the two Ferns in question, for whereas *they* have always *two* stout veins (*costæ*) running up each segment or division of the frond (generally meeting and uniting below the apex), the secondary veins (very conspicuous) running at right angles with them (transversely) across the area between the two costas, and again from the costa nearly to the margin (then uniting); the tertiary

veins forming small, nearly uniform, square areolæ, within which are the ultimate, much divaricating, and free veinlets, bearing the *sori:* in our plant there is only *one* primary stout vein or *central* costa, and from each side of that more than half the space between it and the margin is occupied by a series of large subhexagonal areoles, formed by slender secondary veins, within which alone are the very divaricating and ultimate free, or soriferous, veinlets; and between these and the margin are lesser areoles in one or two irregular series, including their veinlets, always free from sori. Thus in our plant, the sori being confined to the costal primary areoles, they form a pretty regular single series on each side the midrib, whereas in *P. Horsfieldii* and *Wallichii* the sori are widely diffused in the more uniform secondary areoles.

In constituting the genus *Dipteris* (D. conjugata, *Reinw.*, Polypodium [Dipteris] Horsfieldii, *Br.*), Dr. Reinwardt seems to have been guided more by habit than by essential character; for his only description of the genus is "Capsulæ in disco frondis sparsæ, solitariæ aut confertæ. Indusium nullum."—M. Fée, who, as far as I know, is the only author besides Reinwardt that upholds *Dipteris* as a genus, says, "Il est facile de reconnaître ce genre à ses nervures primaires flabelliformes et à l'absence du mésoneure. La fronde est profondément divisée en deux parties, qui tendent à s'appliquer l'une contre l'autre par leur lame supérieure." Strange to say, he seems to be acquainted with only one species, and makes the *Polypodium Wallichii* a synonym of the *Dipteris conjugata* of Reinwardt (Pol. Horsfieldii, *Br.*). Mr. Brown gives the following excellent character of the "subgenus" (of *Polypodium*) "*Dipteris*:—*Sori* subrotundi, sparsi (v. transversim subseriati) inter (frondis palmatæ) venas primarias dichotomas earumque divisiones, venulis divaricatissimis anastomosantibus insidentes. *Indusium* (verum) nullum. —Caudex *repens, teres.* Frondes *elongato-stipitatæ, binatæ;* partiales *dimidiatæ, palmato-lobatæ.* Venulæ *secundæ tertiariæ et ultimæ divaricatissimæ, crebre anastomosantes, penultimæ latere soriferæ, ultimæ apice vix dilatato libero.* Indusium *spurium, vel* (*in* D. Horsfieldii) *pili sorum cingentes et capsulis intermixti; vel* (*in* D. Wallichii) *materia pulposo-grumosa capsulas immaturas obtegens.*"

Even the *binate* character (whence the name) of *Dipteris* is not apparent in our plant, for the primary furcation does not divide the frond into two equal portions: the whole frond is a series of deep dichotomies digitate rather than palmate. If there are characters to distin-

guish our present Fern from *Dipteris* (whether a genus or subgenus), there are assuredly none to separate it from the *Phymatodes* (or *Drynaria*, Bory) group of *Polypodium*: for though there are numerous forms of venation in that genus or subgenus, it would be easy to point out species with almost exactly analogous venation: take the *Polypodium tridactylum*, Wall., for example (Hook. et Grev. Ic. Fil. t. 219), where too there is an approach in the frond to a digitate character, "profunde digitato-tripartita;" and in that group appears to me its proper place.

Tab. XI. Plant:—*nat. size*. 1. Portion of the upper side of a frond:—*magnified*. 2. Portion of the under side, with sori:—*magnified*.

The Uncomo-como, or I'komo-komo, of Natal.

[The following has just been communicated to us by Mr. Moore: it would be a boon to science if all botanists would follow Mr. Moore's excellent example, and correct their often unavoidable errors as soon as discovered.—Ed.]

In reference to the *I'komo-komo*, mentioned at page 227, Mr. D. Hanbury has called my attention to a medicinal Fern, *Uncomo-como*, mentioned by Dr. Pappe in his Cape medical flora, as being used by the Zulu Caffres. This Fern is there identified with the *Aspidium athamanticum* of Kunze. On again turning to Kunze's own description of that species (Linnæa, xviii. 123), I find *Incomo-como* quoted as its native Caffre name. This had been previously overlooked in consequence of Kunze's statement, that the Fern he was describing was a *Nephrodium*; and notwithstanding some points of resemblance, I should still have considered the *Aspidium athamanticum* distinct from the Fern I have described as *Lastrea Plantii* (the latter not being a "*Nephrodium*," not having a "lanceolate" frond, nor "very remote" lower pinnæ, and none of them being "oblong," as Kunze describes his to have been), had not an authentic specimen of Kunze's plant in Sir W. Hooker's herbarium proved the two to be identical, as I learn from Mr. J. Smith, who has compared them. Such being the case, it only remains to cancel the name *Lastrea Plantii*, and to substitute that of *Lastrea athamantica* for the no. 313 of Mr. Plant's collection.

T. Moore.

BOTANICAL INFORMATION.

Extracts from various Letters from Mr. James Drummond, *relating to the* Botany *of* Swan River.

Hawthornden.

Being obliged to return, for the purpose of recruiting our stock of flour and other necessary articles, I write you a few lines, wishing to give some particulars of the journey. For about seventy-five miles from the Moore River, we proceeded nearly due north over a rich grassy country, which exhibited little novelty, but was gay with the flowers of my *Lawrencella lanceolata*, one of the loveliest of plants. Its large seeds afforded food to the *Euphonia splendens* of Gould, which I found breeding in the district. On the summit of a low bushy hill we discovered a charming Leguminous shrub, 3 or 4 feet high, and bearing brilliant scarlet flowers, nearly 2 inches long, varying to yellow, and which resemble those of a *Templetonia* more than any Australian genus I know. At present I have called it *T. regina*, for it is truly the queen of *Leguminosæ*. Its seed-vessels are like those of *Jacksonia*.

Some twenty miles more eastward, we found a singular Leguminous plant, which may be said to be a shrub without leaf or stem; for the flowers, which spring from the crown of the root, grow there in dense fasciculated masses, and only reach the surface of the ground. In full-sized specimens these close tufts of blood-red blossoms are sometimes more than a foot in diameter. If this plant can be raised in pots, it will have a most singular appearance, for all that is seen above the mass of bloom will be a few branched, thorny processes, which doubtless perform the functions of leaves. The pools of water, in the grassy country, exhibit two species of *Lemna*, apparently identical with two that are found in Britain, and two kinds of monœcious *Valisneriæ*. The flats of the Swan River, where the water is salt for six months of the year, and subject to great variations of depth, present another species, with spiral footstalks.

There are some extraordinary natural barrows in this district. I have noticed them as far north as the Beaufort River, and as far south as I have visited these regions, but I can give no guess as to the cause of their formation. They occur of various shapes and sizes, from a few yards to several acres in extent, and may be seen alike in the stiff clay

of the *White-gum* forests, and in the richest grassy country, where the rocks are all granite. The vegetation which they present is peculiar, and several plants grow on them which I have seen nowhere else. To the north I detected a fine *Centaurea*, or plant allied to that genus: the flowers are rose-coloured, and as large as those of *Carduus arvensis;* also a beautiful *Leguminosa* and several Grasses. East from the grassy districts, and about the same meridian of longitude with the Wangan Hills, the country is in many places so thick of scrub, that horses could scarcely penetrate it, and again for miles without a plant, even of grass. We passed the beds of several salt-water lakes, which were but recently dried, and on their banks grew many plants allied to *Chenopodium;* also a curious diœcious *Malvacea*, the first instance I have ever noticed where a species of this Order has the male and female inflorescence separate; two *Grevilleas* with scarlet flowers, new to me, and two *Hakeas*. One of the latter is a small tree, with leaves like your *H. platycarpa*, but much longer and stronger, and terminating in sharp thorns, altogether a most formidable species: it has fine yellow flowers, and upon it grew a new *Loranthus*. The foliage of the other *Hakea* is silvery, striated, and lanceolate, and it produces upright spikes of crimson flowers, excelling those of any other species in beauty; as yet I have only seen it three times. I am sorry to remark that your figure of *H. platycarpa*, in the 'Icones Plantarum,' is drawn from imperfect and small specimens, and which do not exhibit the peculiar character in the hooked solitary spine, which springs from both sides of the capsule. In the same district a noble *Eucalyptus* abounded, which eclipses even your *E. macrocarpus;* its flowers are crimson and golden-yellow, and freely produced on plants which have not attained half the full stature of 12–15 feet high. Sometimes these charming blossoms vary with pale red and white; they hang in profusion from the tips of the branches.

Near our first bivouac I gathered a singular Orchideous plant, having the hinged lower lip of *Drakea;* only three plants could be detected in flower, and one of them I have put into spirits, as you directed. Our present mode of travelling is not favourable for collecting *Orchideæ*, which require close investigation of particular spots in order to detect them, and the same may be said of *Cryptogamia*, though I discovered several *Charas*, which will go home in this set of plants. I also found specimens of the gigantic fungus previously described, and I dried

some slices of it over our fire, with a portion of the leathery covering of its pileus. Soon the *Shepherd's Purse* of our native land will be equally common in Australia. Many species allied to *Lepidium* grow here; but I find that others, which from their similarity to *Subularia aquatica* I had referred to *Cruciferæ*, belong in reality to entirely different families; and, again, my supposed *Ranunculaceæ* have proved, by the help of the microscope you sent me, to be *Umbelliferæ*. I trust to avoid such blunders in future, now that I need no longer trust to the naked eye, and my sight is not so acute as once it was.

We have a curious little plant in this country, nearly allied to *Dichondra repens* of Brown, if not the same; it has long puzzled me, but I have at last discovered that the flowers are subterranean, in at least ninety-nine cases out of a hundred. This underground inflorescence, which never sees the light, yet perfects its seeds in abundance. The plant is common on the banks of all our rivers, from the Swan to King George's Sound. You will be pleased with the three little *Compositæ* I sent you: one seems to have solitary flowers, or perhaps you will consider the whole plant a flower. Another bright yellow-blossomed little fellow, with curious connate yellow perichætial leaves, is a novelty to me in this Order.

I hope you have ere now received specimens, enclosed in a recent letter, of our beautiful little Swan River *Phascum*, allied to *P. serratum*. I shall put into this letter a singular little seaweed, like an *Ophioglossum*: it grows in crevices of rocks on the beach, and is exposed at low water.

The natives talk much of the scarlet-flowered *Banksia*, resembling but excelling *B. grandis*, which inhabits the country to the east. My only way to obtain it would be to go from the Wangan Hills on foot, during the wet season, for in the district it inhabits there is no grass for the subsistence of horses.

During our journey, my son got five or six specimens of the *Warrong*, a curious small kangaroo, with a nail at the end of its tail, but distinct from the species described by Gould as having this appendage. He also procured half-a-dozen specimens of the native *Marmine*, a beautiful little kangaroo, striated crosswise with dark and light grey, and the fur tipped with long silvery hairs, both male and female individuals. Of the *Ephema splendens* we saw six or seven pairs, but only succeeded in shooting one young cock-bird, nearly full-grown: it is

perhaps the largest and finest specimen that has been secured of this noble bird. In a few days we start again for the East.

P.S.—I pointed out the barrows, which I have described in the former part of this letter, to Mr. Jukes, the naturalist of H.M.S. Fly, when he favoured us with a visit to Hawthornden. He has made geology his particular study, and he tried and examined the calcareous nodules which are found in the mounds, and pronounced them to be limestone, and he thinks that the lime was deposited by springs which formerly existed. But the soil of these barrows, although fertile, is quite different from that which has formed, or is in course of formation, in the vicinity of springs. From all I have been able to observe, it seems to me they are deposits of a peculiar salt, probably the same as is found crystallized on the surface of lakes in the Interior.

JAMES DRUMMOND.

NOTICES OF BOOKS.

Botanical Expedition to Oregon.

Under the title that heads this article, a thin quarto pamphlet has appeared, containing a notice of some of Mr. Jeffrey's discoveries, together with five well-drawn and lithographed plates, from the pencil of Dr. Greville. By the accompanying text we are given to understand, that Mr. Jeffrey's period of engagement expires in November next, and that the funds subscribed will be exhausted in paying his salary and expenses up to that date. The committee of the Society under whose auspices he is employed, desire to contract with him for a continuation of his services, and recommend that the subscribers constitute a fresh association for the purpose, to act from November, 1853, to November, 1854. Old subscribers are requested to communicate their views and wishes on the subject to Andrew Murray, Esq:, Secretary of the Oregon Committee, at their earliest convenience, and to enlist the co-operation of others who may be desirous of coming forward as subscribers for so desirable an object.

From an examination of the plants that passed through our hands,

we have no hesitation in pronouncing this object to be one of the greatest importance to the interests of horticulture and arboriculture, as well as of botanical science, and we earnestly hope that the views of the committee to whom the cultivators of these pursuits are under so great obligations will be liberally responded to.

We cannot dismiss this subject without an appeal against the mode adopted of making public (if indeed a printed communication without date or publisher be called so) the names of the new, or supposed new, plants discovered by Mr. Jeffrey, namely, the registering provisional names with "Oregon Committee" as authority. To take one example:—

"690 *b. Ribes Shastense*, Oreg. Com. Shasta Butt. At an elevation of 7000 feet, on granite débris. Fruit round, covered with long prickles."

Can the Oregon Committee for a moment suppose that a name thus thrust into the records of science will be respected, even if it should be registered in botanical works? It is neither fair to expect it, nor fair to scientific men that their progress should be impeded by such a stumbling-block as an awkward name for an undescribed plant, vouched for by an authority that is botanically worthless. So long as the names of the Oregon Committee do not appear, botanists can have no opportunity of judging of the botanical acquirements of the gentlemen of whom it may consist; and as it is of the utmost importance that in attaching the author's name to a species, the name should give confidence to the public in the species so published, it is essential that some more definite authority be supplied than the committee of a temporary association of gentlemen of no recognized scientific status. Not only are upwards of a dozen plants thus registered with new names and no characters at all, or in a few cases with wholly insufficient descriptions; but in one instance we find the Oregon Committee using still more objectionable means to command a place amongst systematists. In the case of a Cruciferous plant with no good flowers, pronounced by Sir W. Hooker to be a new *Arabis*, or perhaps a new genus, the Committee propose calling it "*A. Shastensis*, Oreg. Com." in one case, and "*Jeffreya Shastensis*, Oreg. Com." in the other; thus confessing their own inability to determine a botanical point, and paying a very bad compliment to Mr. Jeffrey and his exertions. If Mr. Jeffrey merits a new genus being dedicated to him—and no doubt he

does—he surely deserves that it should be a good one; and as the value of an honour in the eyes of the world depends primarily on the judgment of the honourer, it follows, that to have a plant named after one by a body that confessedly does not know and cannot make out whether the plant be worthy of the man or no, is no compliment at all; and in some respects the contrary, for it prevents those that do, ever giving Mr. Jeffrey the position he ought perhaps to hold in botanical nomenclature.

In the introductory page the Committee state that they give a list of the plants of which the seeds were lately distributed as named by Sir W. J. Hooker, Dr. Lindley, and Professor Balfour. If these botanists are really answerable for the new species, their names should be appended to them; but though we are expressly told that the figures and descriptions of the cones, leaves, and seeds of the *Coniferæ* are by Dr. Greville and Professor Balfour, the "Oreg. Com." is appended to each new species.

Such doings are to be regretted on the part of a body of gentlemen whom we know to have the interests of science at heart, and we hope to see some of our botanical friends in Edinburgh take Mr. Jeffrey's name and new plants up in a worthy manner.

Conclusion of the late Professor Ledebour's 'Flora Rossica.'

This most important and, considering its scope and object, truly national work, has been brought to a close by the posthumous publication of the fourth volume, the manuscript of which was left (as we are given to understand) in a complete state by its lamented author. Its conclusion marks an era in the progress of botanical science,—that of the publication of the largest Flora, and of the botany of the largest tract of land, that has ever been completed.

The fourth volume contains descriptions of the Monocotyledones, 1052 species, and of Ferns and their kindred Orders, *Lycopodiaceæ*, *Marsileaceæ*, and *Equisetaceæ*, which amount to only 85 more. Excluding the species described in various small Supplements, the total number comprised within the limits of the 'Flora Rossica' is 6365, whence the proportion of Monocotyledones to Dicotyledones is about as one to five. This is a very important datum for the student of botanical geo-

graphy, as it is derived from a far greater amount of materials, and from the vegetation of a much larger area, than has ever before been submitted to such an analysis. According to the generally-received (but probably enormously overrated) estimates of the number of known flowering plants in the whole globe, the proportion of Monocotyledones to Dicotyledones is as 1 is to 4·8, or nearly one to five.

When we consider that the results derived from the 'Flora Rossica' are applicable to a temperate and Arctic Flora, and with hardly a trace of admixture of Tropical genera or families, this approximation of the proportional number of Exogenous and Endogenous plants to that of the whole globe, appears very remarkable, and opens a wide field of inquiry, as we are led to ask whether the data are sufficiently accurate for such generalizations, or whether the diffusion of the two greatest classes of plants is really so equable throughout the globe as these facts would lead us to expect. Considering that the systematic compilation of the 'Flora Rossica' was almost wholly due to the exertions of Professor Ledebour himself, and that he was particularly well versed in his subject, the probabilities are great, that there is so much unity of purpose and design in the whole work, as that the proportions of the great groups may be deduced from its materials with much approach to accuracy.

The most extensive Natural Orders described by Professor Ledebour are the following:—

Compositæ	909	Scrophularineæ . . .	222
Leguminosæ	570	Rosaceæ, including Pomeæ and Amygdaleæ.	220
Cruciferæ	392	Cyperaceæ	200
Grasses	359	Chenopodeæ	185
Umbelliferæ	332	Liliaceæ	167
Caryophylleæ . . .	268	Orchideæ	109
Labiatæ	227		
Ranunculaceæ . . .	228		

There are besides many Orders, containing upwards of 80 species, which it is not necessary to enumerate here. The above will give some idea of the immense amount of materials with which Professor Ledebour had to deal; for whatever opinion may be entertained as to the validity of a great many of the species, the fact of upwards of 6000 plants, whether species or varieties, having been subjected by a really careful and accurate botanist to a more or less critical examination, is

in itself a prodigious work. From a rude estimate of the contents of the index, we find that the astonishing number of 20,000 names are registered, for the 6365 plants described; from which we may assume that each species has on the average three names at least. Considering how many of the plants described are natives of countries accessible only to Russian botanists, and, having been described by these alone, have only one name, this fact indicates the prodigious amount of synonymy with which the science is overloaded. On the other hand, a vast number of the commoner European species are included, and their synonymy and identification have been worked up by Professor Ledebour with the same care and accuracy that he has displayed with regard to the rarer, and hence to many botanists more interesting, Siberian plants. We cannot be too grateful to the author for the labour he has bestowed on the investigation of their synonyms, at best an irksome, and too often an unsatisfactory, task; for as the 'Flora Rossica' must always be a standard work of reference, and will hence be invariably quoted, a vast amount of synonymy is hereby dispensed with for the future. We cannot call those names buried in so admirable a work as this, though it would be well that in one point of view they were considered as such, for the citation of authorities is too often carried to an absurd extent, and savours more of pedantry than of science. The time is approaching when it will be impossible, even were it desirable, to continue the practice, and we should be glad to see limits fixed by authors, and stated in the prefaces to their systematic works; in all of those that refer to plants more especially Russian, Professor Ledebour's work should be the goal, beyond which citation for general purposes should not be carried.

Of the number of plants common to Russia and Germany, a very full list is given at the end of each Natural Order, and we much regret that a general summary of these lists has not been appended to the fourth volume.

It remains to say something of the execution of this great work, in a botanical point of view, and now that the flora of a kindred region, the Himalaya Mountains*, is preparing under our own eye, and that both the 'Flora Rossica,' and the authentically named specimens illustrative of it (communicated to the Hookerian Herbarium by its illustrious author), are in every-day use, we feel it both a duty and pleasure

* Included in the 'Flora Indica,' now preparing by Drs. Hooker and Thomson.

to record the high estimation we entertain of its invaluable contents. To the student of the vegetation of the north temperate zone, whether of Europe, Asia, or America, the work is indispensable, on account of its immense scope, completeness, the efficient manner in which the materials are brought together, their localities grouped and detailed, and the complete synonymy, so far as all Russian works, and those bearing more particularly on the Russian Flora, are concerned, and the critical details, wherever such appear.

The number of species is often greatly over-estimated, and in some genera the diagnostic characters are insufficient for the identification of the plants, but for neither of these defects was Professor Ledebour wholly to blame; a considerable number of species are introduced upon the authority of others, sometimes only by means of the characters communicated to him by correspondence, and the majority of these are as many names for plants already better described in the body of the work. MM. Karelin and Kireloff's species again are introduced, often without examination, and these are not uncommonly either merely slightly altered forms of northern plants which penetrate into the curious desert country of Soongaria, or are Himalayan plants, which seem fated to be described as new over and over again, by whoever investigates them, whether in India or elsewhere.

Some Notes upon the Cryptogamic portion of the plants collected in Portugal (1842–50) *by* Dr. F. Welwitsch. The *Fungi* by the Rev. M. J. Berkeley, M.A., F.L.S.

Under this modest title we have results of an examination of upwards of seventy species of Portuguese *Fungi*, from the pen of the most able and accomplished mycologist of his day. It includes seven new species, and is printed for the use of the subscribers by Mr. Pamplin. As with everything that proceeds from that author, these notes are the fruits of a really careful study of his subject.

The plants form part of the collections noticed as for sale in the third volume of this work, p. 190.

Initiatory attempt to define the species of HEDYCHIUM, *and settle their synonymy; by* DR. WALLICH, V.P. Royal and Linn. Soc.

The genus *Hedychium* is exclusively East Indian, consisting mostly of exquisitely beautiful and sweetly fragrant plants, which flower in profusion during many months of the year, and especially during the wet season. They delight in moist and shady mountain-valleys, from China, where Rumphius was told they grow wild, and the Malay islands and peninsula, where the first species was discovered by that inimitable observer, and others were afterwards added; to 30° north lat. in Western Hindustan, where they are found at Mussuri and on the Suen Range, according to Royle. In the intermediate countries they are met with on the coast of Tenasserim, on the banks of the Irawaddy, in Assam, very profusely on the Kasia (or Kasiya) and Kachar ranges*, in Sikkim, and in Nipal; less numerously in Kamaon; also in Malabar and on the Nilgirries†. Beyond their ornamental, horticultural uses, for which they are eminently qualified, being scarcely exceeded by any of our garden and stove favourites, I am not aware of their possessing any marked medicinal or other virtues. Dr. Royle mentions, in his *Natural History of the Himalayan Mountains*, p. 385—a rich treasure, not to be met with elsewhere, of useful and important information, and of curious and successful research in matters of history and literature connected with his subject—that a warm aromatic root, called *Seer*, *Suttee*, and *Kupoor-kuchree*, in the bazars of Northern India, is produced by *H. spicatum*, the *Sidhuoul* of Mussuri, and that it may perhaps be the *Sitta ritte* mentioned under the Lesser Galangal, by Sir W. Ainslie‡. Rumphius, as well as Valentyn (probably from the

* This is the correct mode of spelling those names, according to the high authority of the Boden professor of Sanscrita at Oxford, Mr. H. H. Wilson. The first is derived from the Sanscrita *Kasa*, being the tall wild Sugar-reed (*Saccharum spontaneum*), so common on the plains and lower hills of Hindustan. The second name cannot be reduced to any Sanscrita word; *Kachar* is Hindi, and implies land lying along rivers, liable to inundation, and of easy irrigation.

† The word is of pure Sanscrita origin, and should be written *Nilagiri* when latinized.

‡ Dr. O'Shaughnessy's *Bengal Dispensatory*, p. 652, quotes this observation from the above work. In a memoir just published by Professor Theodor Martius, on a series of duplicate specimens of drugs from the Indian Department of the late Exhibition, presented to the University of Erlangen by the East India Company, mentions *radix Hedychii spicati*. No native names are given; but the drug is assimilated to *Zedoary*, and somewhat to *radix Martelli* of commerce. *Die ostindische Rohwaarensammlung*, p. 9.

former) informs us, that the flowers of *H. coronarium* are worn by the Malays behind the ears, or as garlands among the hair, for ornament, and that they will perfume a whole room with their fragrance; further, that it is stated in some Malay grammar, that they are used symbolically to denote great promise, by their ample spread and beauty, but equal inconstancy by their delicate and quickly evanescent texture. Both those authors give *Gandasuli*, or *Suli*, as the Malay name of that species. According to Mr. Hasskarl, all the Malayan species have that name. The distinguished traveller and author, Mr. J. Crawfurd, informs me that, in the Malay language, *Ganda* (as does its Sanscrita primitive) denotes smell or odour; and *Suli*, a corruption of *Suri*, in Javanese, a "woman of rank, a queen:" the entire word meaning *Queen's perfume* (see also his recent, most valuable *Dictionary of the Malay language*). In Nipal all the species are called by the general term *Lutisa-soa* (the last term meaning *flower* in the Parbuttea language).

In his splendid work on Monandrian Plants, Mr. Roscoe notices a very old remark of mine, that no plants are more subject to changes, than those belonging to our genus. This applies equally to their wild and cultivated state, and is a constant source of trouble and perplexity to those, who wish to study them in their native places of growth, or in gardens; and the dried specimens are still more difficultly examined, owing to the delicate fabric of the flowers, and generally (though not always) to their colours being lost. A good many species have in consequence been enumerated and described, which have no reality, and are sometimes not even entitled to the subordinate rank of varieties, so that my present humble attempt has consisted chiefly in reducing, under the banners of a moderate series of species, what preceding authors, myself notably included, had, as I now think, needlessly and unwarrantably multiplied. In proof I may mention, that I have myself been often deceived by the freaks and versatility of form and colours in these lovely flowers, and even the stature and whole appearance of the plants I had before me, and have had successive drawings made of them, imagining that they were specifically distinct, whereas they were in reality one and the same plant, only arrayed in various fancy guises. Now, all this may no doubt be ascribed to my own want of discernment. I am consoled however by finding, that the immortal Roscoe has been similarly misled in many instances; and my friend Dr. Hooker has also

several varieties among the exquisite sketches of *Hedychium*, made by him on the spot. Few species only admit of being somewhat rigorously defined; the rest slide suddenly, or by gradations, into each other, so as to elude all endeavours to fix them with any sort of botanical precision. The fact is that, like other very natural groups, ours point-blank refuses to disclose the exact limitations of its members, and leaves the systematizing botanist to grope his way through the maze as best he may. Probably there exist in reality but a very limited number of distinct species; the problem to be solved being: which are those species? Botanically speaking, the genus may be called poor,—such, at least, I believe it will be pronounced hereafter; although to the horticulturist and florist it is exceedingly rich, abounding in transient forms, shades, and varieties. In the meantime I have followed the beaten track, leaving the subject to be taken up by abler hands than mine, who may have favourable opportunities for studying it. I attribute the cause of the great variableness alluded to, to the facilities of multiplication by the rhizomas or roots, and of propagation by the ordinary means of seeds, which the plants produce not unsparingly; and also perhaps to the natural intermixture of varieties of the same species. Thus far only can I admit of any cross-breeding (if indeed it can be so called,) taking place in that part of the globe, where most of my years have been spent. Amidst the natural facilities—I had almost said inducements—which the amazing luxuriance of an Indian vegetation frequently offers for the production of mule breeds, scores of genera crowding their species together into a narrow area of only a few square yards, their pollen transported by winds, animals, and other means, among the hundreds of vegetable occupants: never have I seen a single instance of a hybrid plant. For the validity of this assertion I appeal, without hesitation, to my brother labourers in the field of Indian botany. There, at least, nature repudiates diversifying her creation by means, which would violate the sanctity of the process of fecundation. I can imagine that two plants, specifically different *sensu botanico*, may mix together and produce a third, similarly constituted species; but in that case I should very strongly suspect, that all three formed in reality only one truly natural species. Indeed, the appearance of such a mule-like plant would argue to me, that there was lurking a false species somewhere or other in the genus. I crave forgiveness for this little digression; it is made with hearty and profound

deference to those names, which support a contrary opinion on the subject.

If I have failed in my endeavours to clear the way for future inquirers, it has certainly not been for want of opportunities while I was in India, or of means of verifying species during the latter five or six weeks—such as are not often enjoyed, and for which I feel deeply grateful. I have been permitted to borrow, first, the whole series of specimens in the East India Company's and Sir J. E. Smith's herbarium in the possession of the Linnean Society; secondly, the entire series in the matchless herbarium of Sir W. Hooker; thirdly, the noble collection both in extent and preservation (many specimens nearly as beautiful as in their fresh state!) formed by Dr. Hooker in Sikkim, and conjointly by him and Dr. Thomas Thomson on the Kasia hills, accompanied by all the drawings of the genus made by the former in both countries; fourthly, a number of beautiful sketches made for the late Mr. J. F. Cathcart, during his visit to Sikkim, by Luchmum Sing, an exceedingly clever Hindu painter formerly attached to the Calcutta Botanic Garden; fifthly, Dr. Thomson's small collection of species found in the north-west mountains of Hindustan; sixthly, all the specimens in Dr. Lindley's herbarium; and seventhly, two-and-twenty drawings belonging to the Museum of the Hon. East India Company (three presented by Dr. Hamilton, one by Dr. Wight, and eighteen by myself). I have further had the freest possible access to the specimens in the Banksian Herbarium (salve magnum nomen!) and those in Dr. Horsfield's collection, likewise preserved at the British Museum; and lastly, my friend and successor Dr. Falconer has, with the utmost readiness, furnished me with a copy of my entry of the genus in the manuscript Catalogue of the Calcutta Garden.

I have considered it my duty to refer to and quote, though not according to strict priority, all the authorities to which I had access, not wittingly omitting any, though some might perhaps have been dispensed with, as affording only repetitions of specific characters; and in regard to such, I have not troubled myself or others with the mention of *excludenda synonyma.* My reason for citing the numbers in the Catalogue of the Indian Herbarium, and the Company's drawings, is that others may be able to refer to and consult them if they wish it; but I have not thought it at all necessary to copy the names of collectors from the former.

Hedychium.

A. *Coronariæ.* Spica plus minus arcte imbricata.

1. *H. coronarium;* foliis oblongo-ellipticis subtus pilosulis, bracteis ovatis, infimis aliquando apice foliaceo-expansis, tubo corollæ semi-exserto, laciniis interioribus lanceolatis vel ovatis, labello latissimo subquadrato obtuse bilobo subsessili, stamen paullo superante.

H. coronarium, Koen. in Retz. Obs. Fasc. iii. p. 73. Roxb. in Asiat. Research. xi. p. 325. Ej. Fl. Ind. ed. Carey, i. p. 9*. Rœm. et Schult. Syst. i. p. 19 et p. 560. Spreng. Syst. i. p. 9. Dietr. Spec. i. p. 31. Dietr. Synops. i. p. 9. Smith in Cycl. Rees. xvii. in loco, n. 1. Ej. Exot. Bot. ii. p. 95. t. 107. Blume, Enum. Pl. Javæ, i. p. 56. Bot. Mag. xix. n. 708. Rosc. in Linn. Trans. viii. p. 343. t. 20. f. 6. Ej. Monandr. Pl. n. 51†. Wight, Icon. vi. p. 17. t. 2010. Wall. Cat. Herb. n. 6529.—*Hedychium,* Griffith, Notul. in Pl. Asiat. iii. p. 419 (secunda spec.).—*H. Prophetæ* et *H. album,* Hamilt. Ic. pict. in Mus. Procur. Ind. Or.—*H. spicatum,* Bot. Cab. vii. n. 653. —*Gandasulium,* Rumph. Amb. v. p. 175. t. 69. f. 3.—*Gandasuli,* Lamarck, Encycl. Bot. ii. p. 603.—*H. Gandasulium,* Hamilt. in Herb. Smith.

β. floribus lutescentibus.—*H. flavescens,* Carey apud Rosc. loc. cit. n. 50. Spreng. l. c. Cur. Post. p. 6. Bot. Cab. viii. n. 723. Dietr. Spec. i. p. 32. Dietr. Synops. i. p. 9. Wight, l. c. p. 17. t. 2008. 9. Blume, loc. cit. Hasskarl, Pl. Javan. Rarior. p. 153. Bot. Mag. l. n. 2371 (nom. specif. postea emendat. lviii. n. 3039 in nota) exclus. synon. —*H. coronarii* var., Hamilt. in Cycl. Rees, loc. cit.—*H. chrysoleucum,* Hook. Bot. Mag. lxxvi. n. 4516. Lindl. et Paxt. Flow. Gard. i. p. 110. n. 159. t. 77. Walpers, Annal. iii. p. 604.—*H. sulphureum,* Wall. Ic. pict. in Mus. cit.—*H. coronarium,* Bot. Cab. vi. n. 507. Wight, Ic. pict. in Mus. cit. (cum signo interrog.).—*H. coronarii* var., Carey apud Roxb. l. c. in nota.—*H. coronarii* var. *d.* Blum. l. c. Horsfield Ic. pict. n. 155. in Herb. Banks.

γ. floribus intense luteis.—*H. urophyllum,* Bot. Cab. xviii. n. 1785.

δ. staturâ floribusque maximis.—*H. maximum,* Rosc. l. c. n. 52. Spreng. l. c. Cur. Post. p. 6. Dietr. Sp. p. 32. Dietr. Syn. p. 9.

* This edition is quoted throughout the following pages.

† As neither the pages nor the plates of Roscoe's Monandrian Plants are numbered, I give the numbers in the synoptical table prefixed to the work, being from 47 to 63 inclusive, and belonging to seventeen species.

ε. foliis angustis, spicis abbreviatis, *Blum.*—*H. coronarii* var. *b.* Blum. l. c.

ζ. foliis infra sericeis, *Blum.*—*H. coronarii* var. *c.* Blum. l. c.

Patria. Typica forma floribus candidis centro in citrinum vergentibus propria videtur terris malayanis, fors etiam insulis philippinis (teste specimine n. 765 *a.* Cunninghamio lecto in Herb. Banks., an spontan. ?) et China; per Hindustaniam inferiorem et Peninsulam Indiæ culta, præcipue in Bengalia.—β. Napalia. Simla, *Hb. Thomson.* Sikkim, *Hb. et Ic. aliquot pict. Hook fil.* Jugum kasianum, *Hb. Hook. fil.* (*etiam Ic. pict.*) *et Thoms. Griffith in Hb. Hook.* Assam, *Domina Mack et Griffith in Hb. Hook.* Nilagiri, *Wight et Hawtayne.* Dindygul, *Wight* (*teste Ic. pict. citat.*) Concan, *Law, in Hb. Thomson.* Ceylona, *Walker in Hb. Hook.* Tavoy et Mirgui, *Griffith et Gomez.* Java, in hortis, e Malacca allat., *Blume.* Cochinchina? *Finlayson.*—γ. *Hb. Hook. fil. et Thoms. etiam Ic. pict. aliquot prioris.*—δ. Napalia. Sikkim, *Hb. Hook. fil.*—ε. Provincia Bantam Javæ, *Blume.*—ζ. Provincia Cheribon Javæ, in hortis, *Blume.*

Roxburgh observes very justly in his *Flora Indica*, that *H. coronarium* is a most charming plant, throwing out a profusion of large, beautiful, and fragrant flowers during many months of the year; that is, throughout the rainy season. This remark applies more or less to the whole genus, the plurality of its members being exceedingly handsome and sweetly perfumed; some to a still greater degree even than our present species. What I believe to be the type of the species, having almost pure-white flowers, with a pale yellow tinge towards the throat, does not grow wild in Nipal; at least I never found it there; but it is much cultivated in the gardens of Bengal, where it is a common practice to pull out the flowers from the spike as they open in succession, which they will continue doing for weeks together, and putting them in water or wearing them as ornaments.

2. *H. flavum;* foliis oblongis glabris, bracteis ovatis, tubo corollæ plus dimidio exserto, laciniis exterioribus anguste linearibus, interioribus oblongis cuneatis, stamine labellum subrhomboideum bilobum acutiusculum subæquante vel paullo superante.

H. flavum, Roxb. Hort. Beng. p. 1. Ej. Fl. Ind. i. p. 8 (cum nota Wall.) et in Herb. Banks. Rœm. et Schult. Mant. p. 16 et Add. i. p. 71. Spreng. Syst. i. p. 9 et Cur. Post. p. 6. Dietr. Spec. i. p. 32. Dietr. Synops. i. p. 9. Wall. Cat. Herb. n. 6542. Bot. Cab. vii.

n. 604. Rosc. Mon. Pl. n. 48. Bot. Mag. lviii. n. 3039. Wall. Ic. pict. in Mus. Procur. Ind. Or.—*H. coronarium? potius nova species*, Roxb. in Herb. Banks.

Patria. Jugum kasianum, *Herb. Hook. fil. et Thoms., etiam Ic. pict. prioris.*

As far as I know, this is a good species, and entirely confined to the range named above; nor have I seen it vary. It is smaller than *H. coronarium;* the flowers decidedly so. The filament is mostly a little shorter than the lip, sometimes slightly longer. The specific name correctly indicates the colour of the flower.

3. *H. ellipticum;* foliis ellipticis, spicâ fastigiatâ, bracteis laxiuscule imbricantibus, corollæ tubo dimidio exserto, limbi interioris, exteriore angustissimo brevioris, laciniis cuneatis, stamine labellum lanceolatum acute bifidum bis superante.

3. *H. ellipticum*, Hamilt. in Cycl. Rees. xvii. in loco, n. 2. Dietr. Sp. i. p. 33. Dietr. Synops. i. p. 9. Spreng. Syst. i. p. 9. Rosc. Mon. Pl. n. 55. Bot. Cab. xix. n. 1881.—*H. album β.* Hamilt. in Herb. Smith.—*H. fastigiatum*, Wall. Cat. Herb. n. 6540.

Patria. Napalia. Kamaon; ad alt. ped. 3–4000, *Strachey et Winterbottom in Hb. Hook.*—Sikkim, ad alt. ped. 4–5000, *Hb. Hook. fil. et Ic. pict.* Mont. kasianæ, *Hb. Hook.* et *Thoms.* et *Ic. pict.* prior.

The spike is remarkably fastigiate, even before the expansion of the flowers, which are white with orange-coloured stamen; or yellowish, always so in their declining stage. The species is among the less common in Nipal.

4. *H. thyrsiforme;* foliis ellipticis lucidis subtus vaginisque pilosulis, spicâ subelongatâ squarrosâ bracteis cylindraceo-convolutis recurvis valde approximatis, tubo corollæ tertiâ parte exserto, limbi interioris, exteriore angustissimo brevioris, laciniis lineari-cuneatis, stamine labellum ovale acute bifidum, nunc fere indivisum bis superante.

H. thyrsiforme, Hamilt. l. c. n. 4. Spreng. Syst. i. p. 9. Cur. Post. p. 7. Dietr. Spec. i. p. 33. Dietr. Synops. i. p. 9. Rosc. Mon. Pl. n. 56. Wall. Cat. Herb. n. 6541.—*H. heteromallum*, Bot. Reg. ix. n. 767. Spr. Cur. Post. p. 6. *H. Tocucho*, Hamilt. in Herb. Banks.

Patria. Napalia. Sikkim, *Hb. Hook. fil. et Ic. pict.; Cathcart, Ic. pict.*

Like the preceding, this is a very distinct species (ah si sic omnes!),

and is readily known in all the stages of the inflorescence by the closely approximated, cylindrically convolute or piped, and gently recurved bracts. The flowers are white throughout. It is very common in Nipal.

B. *Spicatæ.* Spica elongata. Bracteæ distantes, patulæ.

5. *H. spicatum;* foliis lato-lanceolatis, bracteis planis vel leviter convolutis tubo dimidio brevioribus, limbi laciniis linearibus stamineque labello ovato obtuse bilobo breve unguiculato brevioribus, interioribus latioribus.

H. spicatum, Hamilt. l. c. n. 3. Royle, Nat. Hist. Himal. p. 357 et 358. Spreng. Syst. p. 9. Cur. Post. p. 7. Dietr. Sp. p. 33. Dietr. Synops. p. 9. Bot. Mag. xlix. n. 2300. Hook. Exot. Fl. i. n. 46. Rosc. l. c. n. 48. Wall. Cat. Herb. n. 6553.—*H. album*, Ham. in Herb. Smith.

β. trilobum; spicâ pauciflorâ, bracteis convolutis unifloris, lobulo brevi cuspidato in sinu labelli.—*H. trilobum*, Wall. n. 6554. Id. apud Rosc. l. c. in obs. generi prefix. et ad *H. spicatum.* Dietr. Sp. p. 37. Dietr. Syn. p. 10.

γ. acuminatum; bracteis convolutis subunifloris, labelli lanceolati lobis acuminatis.—*H. acuminatum*, Rosc. l. c. n. 47. Spreng. Cur. Post. p. 6. Dietr. Sp. p. 34. Dietr. Syn. p. 9. Bot. Mag. lvii. n. 2969. Bot. Cab. xviii. n. 1795.

Patria. Napalia. Kamaon. Rupes calcar Mussuri, *Royle et Thoms.* Jug. Suen in lat. sept. 30°, ad elev. ped. 6000 ad 7000, *Royle, l. c.* Sikkim, ad alt. ped. 5000, *Hb. Hook. jun. cujus Icon. pict.* Jug. kasian. *Id. et Thomson* (*Ic. pict. prioris, etiam* Cathcart).

This is the commonest *Hedychium* in Nipal, where it blossoms during six months of the year. The flowers are white; in var. *γ.* yellowish, with orange claw and stamen. *β.* was originally introduced into the Calcutta Garden in 1817, by the Hon. E. Gardner, and afterwards observed by me in the great valley of Nipal, but sparingly.

6. *H. venustum;* foliis lanceolatis, spicâ nutante, bracteis subconvolutis unifloris, laciniis limbi linearibus, labello lanceolato acute bifido stamen superante, capsulis villosis.

H. venustum, Wight Ic. vi. p. 17. t. 2012.—*H. cernuum*, Wight, ibid. t. 2011.

Patria. Coorg? *Wight.* Jugum nilagiricum, *Id. et Hawtayne.*

The authority of Dr. Wight as a systematic botanist is far too

grave to be easily set aside on any occasion; but on the present I venture to differ from my friend, by uniting his two species into one. I place comparatively little value on the form of leaves or petioles in this genus; and the floral leaf is often seen long-petioled, in cases even, where they are ordinarily almost sessile. The perfectly drooping spike is characteristic, as also, as far as I know, the villous capsules. I believe I had the species very many years ago, from Archdeacon Hawtayne, and it was entered into the Calcutta Garden catalogue for *H. acuminatum*. I omitted to take notice of the particular direction of the spike.

7. *H. villosum;* foliis lanceolatis breviter petiolatis, spicâ elongatâ densiflorâ, bracteis 1–3-floris, calyce tuboque dimidio exserto villosis, laciniis limbi linearibus labelloque oblongo bilobo stamine dimidio brevioribus, antherâ minutâ sagittatâ.

H. villosum, Wall. in Roxb. Fl. Ind. i. p. 12. Cat. Herb. n. 6545. Rœm. et Schult. Mant. p. 15. Spreng. Syst. p. 9. Dietr. Spec. p. 34. Dietr. Syn. p. 9. Rosc. l. c. n. 56.

Patria. Napalia, Jug. kasian. (præter coll. in Cat. Hb. citat.), *Griffith in Hb. Hook. et Lindl. Hook. fil. et Thoms.* Assam (verisim. montes confin.), *Mack in Herb. Hook.*

The very minute sagittate anthers is a permanent character, which at once distinguishes the species from all others. The spike is long and cylindric; or oval, with flowers altogether larger. This latter state is well represented in Roscoe's figure; the former I had drawn and engraved many years ago, as mentioned by that author. They differ not even as varieties, I believe.

(*To be continued.*)

Kew Garden Museum; *or, a Notice of the Origin and some of the Contents of the* Museum of Economic Botany *attached to the* Royal Gardens of Kew; *by* the Director, Sir W. J. Hooker, K.H., F.R.A., and L.S.

In the year 1847, in obedience to the gracious commands of Her Majesty Queen Victoria, those grounds at Kew, including about fourteen acres, which had been devoted to the kitchen and forcing department, were added to the Royal Botanic Garden, together with the

stoves and other buildings. An excellent brick structure, occupied in part by the dwelling of one of the foremen, and in part as rooms for preserving fruit for the use of the Palace, was thereby vacated, and it suggested itself to the Director that, with a little alteration, this might be made available for the reception of all kinds of useful and curious *Vegetable Products*, which the living plants of the Garden and the specimens in the Herbarium could not exhibit; and that such a collection would render great service, not only to the scientific botanist, but to the merchant, the manufacturer, the physician, the chemist, the druggist, the dyer, the carpenter and cabinet-maker, and artisans of every description, who might here find the raw material (and, to a certain extent, also the manufactured or prepared article) employed in their several professions, correctly named, and accompanied by some account of its origin, history, native country, etc., either attached to the specimens or recorded in a popular catalogue. The suggestion was communicated to the heads of the Establishment, the Commissioners of Her Majesty's Woods and Forests: leave was asked to convert the building (at first, in part) into a Museum, and orders were given for one large room to be formed, with a gallery, side-lights, and sky-light, and fitted up with glazed mural and table cases. The foundation of the Museum consisted of the Director's private collection (presented by himself), some few objects already belonging to the Garden, chiefly fruits and seeds, and some given by Mr. John Smith, whose son, Mr. Alexander Smith, received the appointment of Curator. Scarcely were the doors opened to the public, when specimens of various kinds came from all quarters, so that it was soon found necessary to enlarge our accommodation, till, in the present year (1853), all the ten rooms of the building and all the passages are completely filled, and a very large quantity of articles are put aside for want of space to exhibit them. It has now become necessary to apply to the Crown for an entirely new structure, suited to the increased and continually increasing extent of the collection, and worthy of the noble gardens of which it is a part, as well as of the Nation. One has but to see the crowds frequenting the existing Museum (so great that the Director finds it frequently impossible to enter with distinguished visitors, who desire to have objects explained to them), to be satisfied of the deep interest the public take in such a collection,—a collection that at once appeals to the faculties and understandings, showing the practical uses of the study and application

of Botany, and the services mankind thereby derives from them. It has done more to recommend and to popularize (if I may use the expression) the science that communicates the knowledge of the vegetable creation, than all the princely Palms, the gorgeous Water-Lilies, the elegant Ferns, etc., etc., which grace the tropical houses of these noble Gardens. Here (in these Gardens) it is true the public are privileged to see growing Plants of 1. the *Cocoa-nut;* 2. the *Vegetable Ivory-Palm;* 3. the *Wax-bearing Palms* of *Brazil* and of the *Andes;* 4. the *Piaçaba Palm;* 5. the *Coco de Mer;* 6. the *Doum Palm;* 7. the *African Oil-Palm;* 8. the *Papaver somniferum;* 9. the *Bermudian Juniper;* 10. the *Isonandra Gutta;* 11. the *Chinese-grass Plant* (so called); 12. the *Siphonia elastica;* 13. *Rice-paper plant* (so called) of China; the *Chocolate, Tea, Coffee,* and *Sugar-bearing plants,* and hundred others of equal interest; but the visitor receives twofold gratification and twofold instruction, if, while these several vegetable forms are fresh in his memory, he can enter an adjacent building and there contemplate the *products* of these plants, and see, as it were, the uses which the ingenuity of man has derived from them:—1. the food and raiment, the milk, the oil, the wine (toddy), the cups and bowls, cordage, brushes, mats, in short the 365 articles ("as many," the Hindoos say, "as there are days in the year") articles afforded by the common *Cocoa-nut* alone; 2. the ivory-like articles made from the seeds of the *Vegetable Ivory Palm;* 3. the excellent and now commercial wax, yielded by certain *American Palms,* and deposited by nature on the trunk; 4. the useful nuts (for turnery), and still more useful fibre (for the best brooms and brushes) of the *Piaçaba,* as the streets of our great cities can testify; 5. the curious double nuts (with their flowers) of the *Coco de Mer* of the Seychelles Islands, once, when they were ignorantly supposed to be the product of a submarine tree, and only known from having been found floating in the Indian Ocean, valued at the price of a freighted ship, being an antidote to all poisons, "mirum miraculum naturæ," says Rumphius, "quod princeps est omnium marinarum rerum, quæ raræ habentur;" 6. the singularly forked stems (other Palms have unbranched stems), and the large gingerbread-tasted fruits of the *Doum* of Upper Egypt; 7. the fruits and nuts of *Elais Guineensis,* which yield the oil of western tropical Africa, now so largely imported and consumed by Messrs. Price and Co.; and not those only, but the oil itself and the several preparations it undergoes in its progress towards the

perfect candle, in a series of samples presented by that truly philanthropic company; 8. the various and many indeed well-known preparations of *Chocolate*, *Tea*, *Coffee*, and *Sugar*, the latter derived from an *American Maple* and from *Beet-root*, as well as from the *Cane*; 9. *Opium* in its various stages, from the "*poppy-head*," to the pernicious ball prepared for commerce; 10. the progress of pencil-making of the wood of a *Juniper*, improperly called Cedar; 11. the fibre or raw material and cloth, made from the *Chinese* "*Grass-plant*," in reality a *Nettle*; 12. cases filled with the various preparations of the *best Caoutchouc* or India-rubber tree of Pará (*Siphonia elastica*), presented by Messrs. Macintosh; 13. the beautiful substance called Chinese Rice-paper, and long supposed to be a preparation of rice, but here shown to be an exquisite pith of a new plant (*Aralia papyrifera*), only found in Formosa, for the knowledge and for living plants of which we are mainly indebted to Dr. Bowring. The discovery last mentioned is only one of many instances (as will by-and-by be shown) of the *origin* and history of commercial vegetable products, of which we should yet have remained in utter ignorance, but for the formation of this Garden and this Museum. Information of this kind cannot fail to be acknowledged and appreciated in a great mercantile country.

We flatter ourselves, too, that the general arrangement of the collection will prove instructive; and the marked attention of many visitors and the notes that are taken in the room and the works of artists performed there, show that it is so.

While the collection was comparatively in its infancy, we adopted what may be called a popular arrangement of the articles, bringing them together as much as we could under the head of 1. *Fibres* or *textiles*; 2. *Gums* and *resins*; 3. *Dye-stuffs*; 4. *Starches*; 5. *Oils*; 6. *Woods*; 7. *Tannins*; 8. *Drugs*; 9. Food for man; 10. *Basket-work*, etc., etc.; but this was attended with manifest inconvenience. Even to a botanist this arrangement conveyed no idea of the kinds of plants yielding such and such substances, or possessing such and such properties; and it had this further difficulty, that to make each series complete several objects had to be *repeated* under two or more different heads, many drugs being used as food, while some dye-stuffs are valuable as woods, etc. It appeared more advantageous to arrange the collection according to some *botanical* method; and none is so convenient as that employed by Professor De Candolle, in his System

of Vegetables, or, as he has termed his most complete work, the "Prodromus Systematis Naturalis Regni Vegetabilis." This, as is well known to many besides the readers of our Journal, is the "*Natural System or Method*," and it possesses the great merit, that plants are thereby classified mainly from their organs of reproduction; and as it is evident that those families of plants which present the greatest number of points of analogy in those organs, will also display them in the organs of nutrition where the secretions are chiefly formed upon which depend the peculiar properties of plants, so it follows that these properties may be in accordance with their classification into Natural Groups.

It will be seen in an early part of the following catalogue, for example, that the *Ranunculus*- or *Crowfoot-family* contains acrid and poisonous principles: the *Poppy-family* is narcotic, while the seeds are wholesome: the *Sour-sop-family* supplies excellent fruits: the *Cruciferæ* are antiscorbutic, and the *Violet-family* is emetic; while more familiar instances may be mentioned in the *Grass-family*, which yields all our cereal grains: the *Labiatæ* are aromatic and contain volatile oil: the *Bindweed-family* is cathartic: the *Gentian-family* abound in bitter principle, the *Conifers* in Resin, Turpentine, and Tar, the *Mallow-family* in mucilage and fibre. Armed with this kind of knowledge (I mean, an acquaintance with the natural families of the vegetable kingdom), an intelligent traveller in distant regions may safely estimate the properties which a plant, though he has never met with it before, may possess; and many instances are narrated of botanists, who have accompanied exploring expeditions and voyages of discovery, unhesitatingly employing certain plants hitherto unknown, as food, or for the relief of some malady, especially the scurvy. If they were in want of string or cordage, the bark of the *Nettle-family*, and equally of the *Spurge-laurels*, would afford it. They would be aware too, that many plants, justly deemed poisonous in the crude or raw condition, possess this principle in a volatile state, as for example the Potato (though not in a high degree), the *Arum-family*, and the *Cassava* or *Tapioca* plant (eminently poisonous); yet, when the injurious principle is dissipated by cooking or forced out by pressure (witness the tapioca-bags of the South American Indians in the Museum), the residue affords nutritious food, the staff of life to tens of thousands.

The utility of this museum to mankind at large, and of that arrangement of the collection which we have been discussing, is testified by

the remark of an eminent dignitary of the English Church, who after a careful inspection of the contents said, "Now I see, for the first time in my life, on a large scale, a *practical* application of the *science of Botany.*"

In the publication of the following Catalogue and remarks, we would not conceal that we have another object in view besides giving instruction, viz. that of showing our deficiencies, and presenting to our readers an opportunity, which many of them will be glad to embrace, of contributing numerous objects not here recorded, but which it is obvious will be prized and gratefully accepted in a Museum destined to exhibit all *curious vegetable products* and all which contribute to the *wants and to the conveniences of Man.*

Already the Museum owes much of its value to the donations of friends. We cannot here allude especially to more than the "Lawsonian Collection," consisting of Vegetable Products of Scotland, which formed a part of the Great Exhibition of 1851, presented by Messrs. Peter Lawson and Son, and on which they published a volume bearing the latter title, the various Indian products procured by Dr. Hooker during his Mission to Sikkim Himalaya, the produce of the Rice Paper plant from China from Dr. Bowring, raw material and prepared articles of Gutta Percha from the Gutta Percha Company, of Caoutchouc from the Company so named, of vegetable waxes, tallows, and oils from Messrs Price and Co., etc., etc. James Wetherell, Esq., H.B.M. Consul-General at Bahia, has sent many valuable collections from that country; and here I must record the name of the Rev. Professor Henslow, who not only contributed various preparations of great interest and importance, but gave much advice and assistance in the arrangement of the Museum. The names of other donors are placed under the respective articles presented by them.

CHIEF CONTENTS OF THE MUSEUM, SYSTEMATICALLY AND BOTANICALLY ARRANGED.

Cl. I. Dicotyledons or Exogens.

Ord. Ranunculaceæ. Crowfoot Family.

The *Crowfoots*, the *Aconites*, the *Larkspurs*, etc., are familiar examples of this Natural Family, and they are remarkable for the virulent poison contained in so many of them, so that, though few or none are used as articles of food, a great many yield powerful medicinal substances. All are herbaceous, with annual or perennial roots. Acrimony,

causticity, and poison are said to be the general characters of this Order, often combined with a narcotic quality. Notwithstanding however the powerful properties attributed to the *Ranunculaceæ*, it is remarkable how few *have been*, or are still *generally* employed in medical practice. Indeed the majority have fallen into disuse. The Hellebore is the chief evacuant that is retained, and that from its uncertainty is seldom used. Dr. Fleming has shown that of all the European *Aconites*, one only, the common *Monk's-hood*, *Aconitum Napellus*, is of any value; the remainder, including *A. Cammarum*, which the London College of Physicians, Dr. Lindley tells us, directs to be employed exclusively under the name of *A. paniculatum*, being feeble and unimportant in their action. The disuse into which so many of the species have fallen may be attributed to the fact that the caustic principle is considered to be so volatile, that simple drying, infusion in water, or boiling are sufficient to dissipate it or render that property inert. The researches of recent Botanists (Drs. Hooker and Thomson) tend to show that the famous *Bikh* of Northern India, here noticed, is identical as a species with our common *Monk's-hood*, *Aconitum Napellus*; and such it will be described in the forthcoming Indian Flora of those gentlemen.

Hepatica. Hepatica triloba, *Vill.* (*Anemone Hepatica*, L.) Europe and North America. Astringent.

Pasque-flower. Anemone pulsatilla, *L.* Europe. Recommended in cutaneous diseases and those of the eye.

Crowfoot, upright meadow. Ranunculus acris, *L.* Roots and leaves. Europe.—*Lesser Spear-wort.* Ranunculus flammula, *L.* This and the preceding, as well some others of the genus, in the herbaceous parts or roots, are employed medicinally, chiefly in rustic practice; being acrid and irritant; internally they occasion vomiting.

Hellebore root. Helleborus niger, *L.* Often called *Christmas Rose.* South of Europe. A drastic purgative, diuretic, and emmenagogue. Imported to England in large quantities from Hamburgh, and sometimes from Marseilles; into the French capital from Auvergne and Switzerland. Roots of *H. viridis* are not unfrequently mixed with them on the Continent, and are said to be an efficient substitute.

Fetid Hellebore. Helleborus fœtidus, *L.* Green leaves chiefly used in rustic practice. Anthelmintic. Roots (Mr. Kent). Extract; from North America.

Gold Thread. Coptis trifolia, *Salisb.* United States and Canada.

Pure and powerful bitter; the *roots* are used as tonics, especially in North America, the plant being a native of Canada and Siberia (United Society).—Our specimens are packed and compressed in oblong cakes, a common practice with the herbalists in the United States: or at any rate with a remarkable and highly respectable religious sect there called the "United Society;" more generally known under the denomination of "Shakers." Their preparations and extracts are highly valued throughout the United States, and their export trade is very large. We are indebted to this Society for an extensive collection of native and cultivated herbs. They are easily recognized by being packed in cakes, a form which most of them retain after being removed from their papers. —See some account of this Society in the present volume, p. 278.

Mishmee Teeta. Coptis Teeta, *Wall.* Assam (E. I. Company; in small baskets).—Used as a tonic in Assam.

Fennel-flower. Nigella sativa, *L.* Europe and Northern India. Seeds and oil; the latter used by "English's Patent Camphine Company." Seeds were formerly employed instead of pepper, being pungent: still used in India as a condiment and a medicine. Dr. Royle is of opinion that the pungent seeds used by the Affghans for flavouring curries, under the name of Siak Dana, a species of *Nigella*, is probably the *Black Cumin* of Scripture.

Stavesacre (Seeds). Delphinium Staphisagria, *L.* These are extremely poisonous, and owe their quality to a peculiar alkali called *Delphinia*, and are powerfully emetic, drastic, and inflammatory; chiefly used in external applications. Native of the South of Europe.

Field Larkspur. Delphinium consolida, *L.* Seeds. Yield a blue dye (Messrs. Lawson).

Aconite Root and *Extract.* Aconitum Napellus, *L.* South of Europe (J. H. Kent, Esq., a portion of his beautifully prepared collection of pharmaceutical indigenous herbs). A narcotico-acrid poison; and many cases are recorded of fatal results from the improper use of it. The root and leaves and extract are much used in paralysis, epilepsy, and various other maladies. Samples of pure *Aconitine* (Mr. Morson); *Mannite* from Monk's-hood root (Messrs. J. and H. Smith).

Zemu. Under this name we have the root of an *Aconite*, from Northern India (Dr. Hooker). Species and properties unknown.

Bikh. Aconitum ferox, *Wall.* A. palmatum, *Don.* Roots. Nepal and Sikkim (Dr. Hooker). Root. Ranks amongst the most virulent of vegetable poisons. The Goorkahs employ it to poison their

waters, to protect their country from an enemy. Much used in Indian practice; as already stated, Dr. Hooker is of opinion that this is a plant not specifically distinct from *Aconitum Napellus*, L.

Butees. Root. Aconitum heterophyllum, *Wall.* Simla (Major Madden). Used in India as a tonic.

Pæony. Pæonia officinalis, *Retz.* South of Europe. Flowers, seeds, root. Supposed to be antispasmodic; the seeds emetic and cathartic.

Bane-berry. Actæa spicata, *L.* Europe. The black berries are poisonous: the roots antispasmodic, expectorant, and astringent, and considered to have afforded great relief in catarrhs.

Black Cohosh Bark. Cimicifuga racemosa, *Bart.* North America. Nauseous and astringent, regarded in the United States as a remedy for the bite of the rattle-snake.

Mandrake root, American, or *May-apple.* Podophyllum peltatum, *L.* North America. Cathartic. The leaves are poisonous, the whole plant narcotic; the fruit acid, whence it is said to be called "*wild Lemon.*"

Yellow-root, Parsley-leaved. Xanthorhiza apiifolia, *L'Hérit.* North America. Shrub contains both gum and resin, intensely bitter; the wood and bark pure tonic bitter.

(To be continued.)

Jottings on the Mountains; or Notes of a few days' sojourning among the Mountains of CLOVA, etc., *in the Summer of* 1853; *by* Mr. A. CROALL.

August.—Arriving at the inn, Kirkton of Clova, about five o'clock P.M., we had some refreshments, and then proceeded along the foot of the Barrier; and on the slopes below the cliffs, the rills were fringed with *Tofieldia palustris, Bryum julaceum, pallens,* and *ventricosum,* all in fruit; *Tofieldia* was in flower as well as fruit, and extended to within 300 feet of the base, and nearly to the base of the cliffs. On the boulders, *Trichostomum heterostichum* and *microcarpum, Anictangium ciliatum,* and *Gyrophora pellita, proboscidea* and *cylindrica* were plentiful, but not so fine as around Loch Brandy and Loch Wharl.

On ascending the stream between Carlourie and the Barrier, on an isolated rock at the base of the cliffs, gathered fine specimens of *Bartramia Halleriana* in fruit. Turning to the right, and proceeding up a "dry

run" among the cliffs, *Polytrichum hercynicum* occurred, very fine and in great profusion, covering the perpendicular faces of the little step-like hillocks, producing capsules and male flowers in abundance. The more elevated knolls were covered with finely fruited patches of the curious *Diphyscium foliosum*, whilst in crevices and somewhat damp recesses of the rocks, close by, the singular *Œdipodium Griffithianum* was fructifying abundantly, many of the stems half an inch in length. On the bare spots among the rocks *Conostomum boreale* was fruiting in profusion, and on bare ground on the summit above *Solorina crocea* was gathered sparingly.

At the base of Craig Rennet, on the Glen Dole side, *Linnæa borealis* was flowering abundantly; here also *Alchemilla conjuncta* has been since rediscovered by my acute friend Mr. Black. Higher up, on the principal stream, *Diphyscium foliosum*, *Bryum Zierii* in fine fruit; *Saxifraga oppositifolia* and *Silene acaulis* were still in flower, the latter abundantly towards the summit. On damp rocks about the stream *Hieracium Lawsoni* waved its stately plumes, and on dry rocks on the left the large flowers of the *Hieracium alpinum* nodded in the breeze. Creeping on a tuft of wet moss *Hymenophyllum Wilsoni* was found sparingly in fruit, and the shelving rocks near the stream were beautifully carpeted with large fleeces of *Trichostomum patens*, with stems from three to five inches in length, and capsules in abundance, and along with it fine specimens of *Grimmia stricta*, Turn. *Salix reticulata* was plentiful among the damper rocks, and near the falls *Jungermannia concinnata*.

While looking up from the bottom of the Glen, towards the summit of the cliffs, the latter dwindle into little step-like shelves, and the streams and waterfalls all but disappear; but on scrambling up, the former will often be found expanding into broad shelves, where the weary botanist may repose in safety after his toilsome ascent, and the latter are frequently numerous and pour their foaming waters over the precipices with a deafening din, scattering their froth and spray for yards around. Amid such scenes several alpine plants display their greatest beauty and luxuriance, while others are *there only* to be met with.

Nothing could excel the brilliant festoons of the *Saxifragæ*, *aizoides*, *hypnoides*, and *oppositifolia*, that here depend from the wet and dripping rocks, or the starry beauty of the *Saxifraga stellaris*, whose often single stems, terminated by clusters of flowers, remind one of minia-

ture constellations, adorning the dark recesses among the mouldering *débris*. *Veronica alpina*, *Epilobium alpinum* and *alsinifolium*, *Carex atrata* and *pallescens*, *Saussurea alpina*, *Thalictrum alpinum* here display their richest luxuriance. The first however seems to delight more in the dry grassy banks along the streams, and where the grass is not too close; and in such situations on the banks of the White Water it grows abundantly and very fine.

On reaching the summit, the peaty flats supplied us with *Rubus Chamæmorus* and *Cornus Suecica* in fruit, and *Vaccinium uliginosum* in flower and fruit; these however seldom ripen, and generally drop off at the first touch of the sacrilegious hand of the gatherer.

Splachnum sphæricum was plentiful on the bare peaty soil, and at each end of the shankbone of a deer a tuft of the small form of the *S. mnioides* occurred, and on a bank close by a fine tuft of *S. angustatum*. It is curious to observe the predilections of plants for certain localities. These elevated and spongy moors are the chosen habitat of *Rubus Chamæmorus*, yet in sheltered hollows, and in places where by a species of natural drainage the peat has been converted into a more genial soil, the *Rubus* displays a far more luxuriant foliage and a more tempting fruit; here however the fruit will hardly be ripe before the end of September.

On the west side of the stream between Craig Mair and Craig Kennet, a little before its descent into Glen Dole, *Hypnum revolvens* was fructifying abundantly. At the northern base of a dripping rock, between the Fealah Burn and the White Water, where large patches of snow still cooled the atmosphere around, *Thalictrum alpinum* was only yet coming into flower. Between this and the White Water, in hollows among the boulders, *Polypodium alpestre* was first met with, but the fronds were delicate and the fruit scarce. On crossing the White Water however, near the shieling of Linkar, it occurred in abundance, presenting all the ordinary forms in the frond of *Athyrium Filix-fœmina*. Some of the fronds were tall, rigid, the rachis of a pitchy-brown colour, the pinnæ and pinnulæ distant and more or less decurved; others were broader, of a pale-green colour and delicate texture, the pinnæ and pinnulæ flat and more approximated. The fronds were here of larger size than anywhere else, either in Glen Dole, Glen Fiadh, Glen Callater, or Lochnagar, and the fruit more abundant.

On descending the stream between Craig Maid and Craig Rennet

(the easternmost of the two), *Bryum Zierii* was plentiful, also *Bryum elongatum*, *crudum*, and *pallens; Gymnostomum Lapponicum* and *Hedwigia æstiva*, both in fruit; *Weissia crispula* and *tenuirostris, Dicranum polycarpum, Didymodon capillaceus, Diphyscium foliosum, Hypnum pulchellum* and *molle*. In addition to these, the western stream afforded *Sonchus alpinus, Salix lanata, arenaria,* and a profusion of *S. reticulata* and *Dryas octopetala, Pyrola rotundifolia* and *secunda*. The latter is rather scarce in Clova, in Glenesk it is most abundant; *Carex atrata, capillaris, pallescens, Polypodium alpestre* at the middle falls; *Saxifraga hypnoides* still in flower, *Hieracium alpinum* in plenty, *Vaccinium uliginosum* with both flowers and fruit; the latter nearly full size, of a glaucous-green colour, almost of the same colour as the leaves, the form seldom quite round, often almost square or cubical with blunt angles: although both the flowers and fruit are quite healthy here, they were very apt to drop off when handled.

A Storm.—The morning of the day allotted to Glen Fiadh looked rather gloomy; the mist rested on the higher summits of the mountains, occasionally rolling down their sides to some distance; yet the natives assured me that if the wind kept from the west the day would clear up. I had only reached Bradoony however when it wheeled round to the south, and rain began to fall, and by the time I gained Glen Fiadh the wind had risen to a gale, and came sweeping down the glen in strong gusts, with heavy showers of rain, so that I was often obliged to take shelter by the large boulders till the blast was over. I proceeded towards the end of the glen, in the hope that the high cliffs would in some measure screen me from the storm; but the wind was now so strong, the rain so heavy, and the mist swept down the glen in such dense volumes, that I had enough to do to keep my footing, and could only see a few yards around me. Occasionally the mist would sweep down the glen like a dark cloud, leaving the whole clear except the summit of the cliffs, displaying the rugged shelving precipices, the foaming torrents tumbling on in their rocky beds down to their junction with the Esk at Acharne. This lucid interval was immediately followed by a torrent of rain, and another dense volume of mist came tumbling in at the head of the glen, and came rolling down the cliffs, so dense that I could almost fancy I felt it enveloping me in its folds. The "dry runs" had now been converted into streams, the streams into torrents, carrying along with them fragments of rock

and other *débris*, loosened from the cliffs above by the rains; while every now and then the descent of some huge mass, at no great distance, thundering from crag to crag, afforded a rather broad hint, not at all difficult to understand, that danger was not far off.

The day thus passed on: I had only at intervals picked a few specimens of the more common plants, and had nothing else to do but admire the "warring elements," the "rending rocks," and the foaming streams, till about five o'clock P.M., when I resolved to attempt a homeward march. I had just reached the foot of Glen Fiadh, when dark spots began to appear in the dense canopy overhead; the mist, which had hitherto rolled down the hills, began to roll upwards, and sweeping over their tops was out of sight in an instant. In a few minutes the whole scene was changed: the clouds began to break away from the zenith, and the bright sky appeared between; the wind had again settled in the west, the sun burst through in full splendour, and the whole valleys were speedily in a blaze. It was now however too late to return, and I proceeded homewards, reflecting, that if the day was lost to botany, I had, as a native of Scotland, not only "loved her mountains, but enjoyed her storms."

(*To be continued.*)

On a new species of HORKELIA, *from the Upper Platte River; by* SIR W. J. HOOKER, D.C.L., F.R.A. and L.S.

(TAB. XII.)

HORKELIA GORDONI, *Hook.*

Pubescenti-viscosa, foliis numerosis radicalibus linearibus elongatis brevi-petiolatis pinnatis, pinnis numerosis alternis parvis profunde 3–5-partitis, lobis cuneatis obtusis integris v. bifidis, scapis folio longioribus nudiusculis, cymis multifloris capitatis, calycis hirsuti lobis ovato-lanceolatis petala spathulata duplo excedentibus, bracteolis lineari-spathulatis, radice lignosa fusiformi, collo foliisque ad basin copiose resinosis.

HAB. Upper Platte River, *Mr. Gordon*.

This was discovered and sent to me in 1844, and I have never seen the same very distinct species from any other source. It is distin-

guished from every other species of the genus, by the small size of the leaflets, the exactly cuneate form of the segments, which are either entire or bifid. The base of the leaves, and the top or collum of the root, abound in a dark brown fragrant resin, which seems to unite those parts into a mass.

TAB. XII. 1. Flower. 2. Petal. 3. Leaves:—*magnified.*

BOTANICAL INFORMATION.

Botanical News from Italy.

Florence, 16th August.

You will no doubt have seen by the newspapers the progress and ravages of the disease of the Vine in Italy; I will not therefore revert to the subject, nor give any detailed account of what has been lately published concerning it, but rather proceed to notice a few publications more particularly botanical.

I shall first mention a work by Professor Massalongo, of Verona, entitled, "Ricerche sull' Autonomia dei Licheni crostosi, e materiali pella loro naturale ordinazione." It contains an abridged history of all those crustaceous and pustulous Lichens which the author has been able to study on living specimens, with a view to determine the limits of their development and their specific characters; they are divided into seventy-one genera, twenty-one of which are new. This work forms an octavo volume of 224 pages, illustrated by 400 microscopic figures representing the thecæ and spores of the species described; its price is 20 francs. A kind of supplement to it will soon appear, under the title 'Memorie Lichenografiche,' containing descriptions and figures of the other orders of Lichens.

Dr. Bergamaschi has published an account of a botanical excursion in the valleys round Bergamo, together with a catalogue of the plants growing there, and M. Gennari, in the Memoirs of the Academy of Turin, an interesting catalogue of a hundred plants to be added to the 'Repertorium Floræ Ligusticæ' of Professor De Notaris.

Professor Joseph Bertoloni was at Florence a few days ago, on his way back from Sarzana to Bologna; he informed us that his father

intends completing this year the publication of the 'Flora Italica.'—*Bonplandia*, October 15th, 1853.

Gum Trees of Van Diemen's Land.

The following very interesting information on the *Measurements of different Gum Trees in the vicinity of Hobart Town*, has been kindly communicated to us by His Excellency William Denison, Esq., the Governor of Van Diemen's Land.

No. 1. 215 feet high. Girth at 6 ft. from the ground, 14 ft.; at 14 ft. from the ground, 11 ft.

No. 2. 184½ ft. high. Girth at 5 ft. from the ground, 12 ft. 3 in.

No. 3. 181½ ft. high. Girth at 5 ft. from the ground, 10 ft.

No. 4. 188 ft. high. Girth at 6 ft. from the ground, 16 ft. 10 in.

No. 5. Large tree in gully on flanks of Mount Wellington, 205 ft. high, but the top had broken off by the wind, it had probably been from 30 to 40 ft. higher. Girth on the ground, 76 ft.; girth 21 ft. from the ground, 25 ft.

No. 6. Gum-tree in Tasman's Peninsula, 130 ft. to the first branch. Girth at 5 ft. from the ground, 16 ft.; girth at the first branch, 7 ft. 4 in.

No. 7. Stringy-bark, 114 ft. to the first branch, 192 ft. total height. Girth 5 ft. from the ground, 15 ft.

No. 8. Gum-tree, 199 ft. high.

No. 9. Gum-tree, extreme height, 127 ft. Girth at 2 ft. 4 in. from the ground, 4 ft. 9 in.; girth at 22 ft. 4 in. from the ground, 3 ft. 2 in.; circumference without bark at 2 ft. 4 in. from the ground, 4 ft. 2⅔ in., but there was a projection at one point, and the average section had a radius of 7½ in. The radius was divided into three parts, two of 3 in. and one, the outer, of 1½ in.; the number of annual rings in each division was then counted: in the first 3 in. there were 26 rings; in the second, 26; in the third, of 1½ in., 12 or 13: total, 64 or 65 rings.

In another tree, whose average diameter was 57 in., radius 28·5 in., the surface of the section being planed and the radius divided into sections of 3 in., the number of rings in each section beginning from the centre was as follows:—

	No. of rings.
No. 1	9
2	21
3	32
4	16
5	13
6	17
7	18
8	19
9	17
9½	21
28½ inches.	183

	No. of rings.
No. 1	12
2	21
3	30
4	14
5	14
6	16
7	13
8	10
9	16
10	10
11	15
11½	12
34½ inches.	183

The second table gives the rings upon a radius passing through a projecting portion of the same section, the number of rings being the same, but the distribution of course different.

I had an idea that, as the Gum-trees evidently make two shoots in the year, one in the autumn and another in the spring, the summer being an apparently dead time for them as regards growth, there might be a growth of two rings in the course of one year; but on reference to the size of these trees, and the rate of increase shown by dividing the number of rings by the radius in inches, I do not think this supposition can be correct:—

$$\frac{183}{28{\cdot}5} = 6{\cdot}4 \text{ rings to an inch.} \qquad \frac{64}{7{\cdot}5} = 8{\cdot}5 \text{ rings to an inch.}$$

In this one case the tree would increase in diameter one inch in 3·2 years; in the other the same increase would take place in 4·2 years. I do not think we could assume a rate of increase double of the above, which we must do were there to be two rings added in each year.

W. D.

Extracts from various Letters from MR. JAMES DRUMMOND, *relating to the* BOTANY *of* SWAN RIVER.

(*Continued from p.* 315.)

Hawthornden.

My last letter gave an account of my journey to the North, and I now send a few particulars of one which I have more recently made to the East. At the spring called Bibagoir I found a fine *Mesembry-*

anthemum, with flowers two inches across and deep rose-red, and seed-vessels of a highly remarkable structure. Another species had inconspicuous blossoms, borne generally in threes; I also found the common fruit-bearing species in bloom near the spring. All these I dried in an oven, and I mean to send them home.

The native called Mangerroot was our guide: he owns the land, and is acquainted with every spring and pool for a hundred miles to the eastward; but we could only proceed about sixty miles, to the head of a fresh-water river, called Wallemarra by the Aborigines, where we found large pools in extensive flats and water of admirable quality. We are ignorant where this river rises or whither it goes. On the banks and in the pools I found several new plants. One is a remarkable Grass with the habit of the *Bamboo*, 8–10 feet high, and as thick as a goosequill. A *Myriophyllum*, which I had not seen before, inhabits the water, and a curious *Elatine*-like plant with invisible flowers and conspicuous seed-vessels. It is worthy of observation how many plants accommodate themselves wonderfully to circumstances. Thus a small *Cardamine* grows with us on the banks of streams and in the bottom of pools, where it is always submerged, producing in both situations abundance of perfect seeds. . . . .

I think I formerly mentioned a curious Alismaceous species, which rarely perfects its flowers, yet always bears plenty of seed. I have now got another individual of the same genus, whose complete inflorescence, if ever it has any, has eluded all my researches. But you will probably consider a sort of *Elatine* as the most remarkable of this group. I sent specimens of the immersed state in a previous collection: the plant is surrounded with air-cells, which cause it, when detached from the earth in which it vegetates at the bottom of pools, to float at once to the shore, where it strikes root and developes its curious triandrous, tripetalous, trigynous flowers, having each a three-celled capsule. I have ascertained that in the minute submerged concealed flowers, the anthers burst internally, and the seeds arrive at maturity in a much shorter time than they require when the inflorescence is exposed to the air. When all the parts are developed in the submerged flowers I can detect but one covering to the seeds, which seems composed of the united petals, the true germen not being developed.

I found two additional species of a curious *Vallisneria*-like genus. One grows in pools three feet deep. The plant is much branched and

three or four feet high, none of the leaves reaching the surface, but the male blossoms are raised on footstalks which are straight, while the footstalks of the females are spiral, so formed, apparently, to enable the plant to mature its seeds by following the receding water, which, in this arid country, dries up with wonderful rapidity. The other species, which has the habit of *Arenaria fastigiata*, inhabits similar places and has both kinds of blossoms sessile. My large collection contained a *Cerastium* very like *C. vulgatum*, whose narrow bifid petals, half as long again as the calyx, will place it in a different section of the genus; and I have now got another, which I am unable to distinguish from *C. semidecandrum*. Sometimes I think these species of *Cerastium*, the *Erodium cicutarium*, and some other plants which assuredly were here before the Swan River Settlement was formed, may have made their way from Sydney. And it is a striking circumstance that the natives allege that the wild cattle, which we had always supposed to be the progeny of animals brought by us, come originally from the north-east, and were here before the Settlers came to the Swan.

The Aborigines assured us that there is no water for four days' journey to the east of Wallemarra, except what is contained in the trunks of hollow trees. I examined some curious salt lakes in that direction. In one I gathered a little annual *Cress* which was new to me, and three shrubby *Salicornias*. The lake had no outlet, and the parallel terraced banks which environed it gave ample evidence that the water in it was once much higher than it is now. A fine white-flowered species of *Rutaceæ* grows on the tops of the granite hills in this direction, also a new purple-flowered *Kennedya*, of which I send specimens in seed. In the natural veins which occur in immense blocks of granite, I noticed the splendid scarlet *Myrtaceous plant* which I have often mentioned. Owing to the barrenness of the spots where it occurred, the shrub here assumes a ragged stunted appearance, like trees artificially dwarfed by the Chinese, and the plants all seem as old as the rocks whereon they grow; but I saw one magnificent specimen, 15 feet high and as much broad across the top, completely covered with flowers, which resemble those of a *Eucalyptus*, and are splendid scarlet. The genus is however quite distinct from *Eucalyptus*, by its small silvery leaves and the form of the petals. On a hill, east of Wallemarra, I found a fine *Candollea*, with small silvery foliage and fine yellow flowers: the sepals and bracteas which surround the inflorescence are remarkably covered

with rich velvety down. At the same spot I gathered a fifth species of my *Grevillea*-like genus, with flowers deep yellow, and a new black-flowered *Grevillea*. This latter immense genus must soon be split into many; but I am of Mr. Brown's opinion, that it is better to retain the sectional divisions of *Grevillea*, till this vast country shall be better explored. A beautiful *Diuris*, which I call *D. picta*, was among my discoveries at this time: the flower is large and white, the lip margined with purple, and all the divisions of the perianth more or less marked with the same colour: it grew in considerable quantities in a dry watercourse.

I shall start again for the North in a few days; but I mean, before I go, to take up all the roots I can find of the bulbous *Droseras*, and send them packed in a small box of dry earth. The stationary character of these bulbs is very different from the *Droseras* of Europe. If, for instance, a very small plant of *D. macrophylla* be carefully removed, it is easy to see, by the relics in the same spot, that these bulbs have occupied the same patch of ground perhaps for fifty years, the remains of the old flower-stalks and coverings of the roots which have been annually given off appearing mixed with the soil. I shall put in, with the *Droseras*, some roots and seeds of the *Phascum* like *serratum*, and some other minute Mosses; and I have no doubt, if the soil be carefully spread over the pots in the greenhouses of the Kew Gardens, you will see these curious little *Cryptogamiæ* make their appearance, and they will afford a rare treat for muscologists. I have observed three species of a curious *Curvicollum* genus of naked-mouthed Mosses, or rather the capsules may be said to be cut across the middle. I enclose a few specimens of a very small kind; but small though it be, this Moss is not annual: the plants which spring up this year do not produce capsules till the next; but you must observe that there are only two or three months annually in this country when anything like life appears in these plants. There is a remarkable ferruginous stain on that part of the seta which is included in the sheathing bases of the leaves. The extraordinary little Moss with the ribbed veil, I consider a peculiar genus of naked-mouthed Mosses. The veil in the specimen now sent is curiously laciniated at the edges.

(*To be continued.*)

NOTICES OF BOOKS.

Third Edition of Dr. Lindley's '*Vegetable Kingdom.*'

We record with great satisfaction the publication of a third edition of this invaluable work, not only because of its intrinsic merits, but as a proof of the rapidly increasing demand for sound botanical information. The first edition (an impression of 1000 copies) of the 'Vegetable Kingdom' appeared in 1846, and was followed in a few months by a second; since which the demand has not flagged. In the true spirit of advancement with the science he so ably cultivates and illustrates, Dr. Lindley has brought the present edition up to the state of botany at the present day, so far as it was practicable to introduce the required additions and alterations into a sterotyped work. A vast number of genera are added; many beautiful woodcuts, and valuable information on all branches of botany, systematic, physiological, anatomical, and economic, are appended to a great many of the Natural Orders; so that the work is still what it was, the best and only really excellent English exposition of the vegetable kingdom in its widest sense. As such it not only lies by our side as a work of constant reference, but is the traveller's handbook of botany where none more bulky can be carried, and is sent to all parts of the globe as the best instructor of the student or amateur.

Of the new and peculiar views on nomenclature and system which appeared in the earliest editions of Dr. Lindley's works on the natural arrangement of plants, many, though strongly opposed at first, have already gained universal consent. Others, though so long submitted to the attention of botanists, have met with no favour, and we confess to feeling disappointed at finding them still permitted to retain so prominent a place. We allude especially to the value which is attached by the author to the classes of Dictyogens and Rhizanths; to the separation in a natural arrangement of *Apocynaceæ* from Asclepiads, of *Ericaceæ* from *Vacciniaceæ*, and four or five others; and to the close approximation of *Santalaceæ* to *Aristolochiaceæ*, *Junceæ* to *Orontiaceæ*, and the separation of these last again from *Araceæ*. We are inclined to believe that, in all these and in very many similar cases, too much stress is laid on mere technical characters (as the

quantity of albumen and the size of the embryo), while characters of greater importance, but less easily defined, and in consequence less easily made manifest to the beginner, if not entirely neglected, are underrated.

This is scarcely the place to explain the reasons on which we found our conviction, that with regard to natural arrangement we have, in many respects, to regret in the 'Vegetable Kingdom' a progress in a direction which it will be necessary to retrace. It is however the less necessary to enter into details, because our principal objection to the prominence given to these universally rejected views in an elementary work, is that they have led the author to an arrangement which wants that superiority over systems previously known and generally used among systematic botanists, which would compel its adoption by every candid botanist. We do not doubt that ere long a system of Alliances, such as Dr. Lindley has so ably originated, will be discovered, far superior to any at present known; and every attempt to improve our present arrangement is undoubtedly praiseworthy and of the utmost interest. It will however, we believe, be universally conceded that the rejection of systems of acknowledged merit, when prompted by the desire to promulgate botanical views such as those referred to above, which, after many years' probation, have been repudiated by botanists in general, is, to say the least of it, undesirable in a work which is indispensable both to beginners and proficients. We are the last to wish that Dr. Lindley should refrain from the expression of the most untenable of his conclusions; on the contrary, there is, even in the most contradictory of them, much beyond mere originality; they evidence deep knowledge and great experience, and every one of them may be studied with profit; but we think that a fair exposition of them all is not incompatible with the scope and object of a 'Vegetable Kingdom' arranged in accordance with those laws of affinity which nine-tenths of the greatest botanists of Europe and America consider established, and unshaken by Dr. Lindley's arguments. We trust that in a future edition,—which we hope and believe is not distant,—our author will not only reconsider his evidence, but re-examine his materials, particularly in cases where his opinions are diametrically opposed to those which are universally recognized; and we are fully convinced that the necessary and careful study will, in many instances, lead him to attach less importance to many of the general characters

which now tend to give to his Classes and Alliances an artificial character, and prevent the thorough appreciation of his work by botanists.

We have dwelt at greater length than we intended on the blemishes of this admirable work, and in doing so we have undertaken a most ungracious duty; but certainly we have experienced some inconvenience in the course of our every-day use of the 'Vegetable Kingdom.' It must however be carefully borne in mind, that if, on the one hand, Dr. Lindley claims no ordinary share of such peculiar views, on the other hand that there is, with the exception of Robert Brown, no man in England who has thrown so much light upon the affinities of the Natural Orders, nor any, in this or any other country, who has diffused so much sound botanical information regarding them amongst all classes of inquirers. Whether by his lectures, by his works on all branches of botany, elementary and profound, on medical, economical, physiological, or systematic subjects, or by his indefatigable labours for horticulture and horticulturists, for public gardens or for private, for the Government or for the people, he has been prominently before the public for many years as the most energetic and useful botanist of his day, as he is, for his knowledge and varied acquirements, one of the greatest. His zeal in diffusing what he believes to be truth, and his unvarying practice of withholding no information, books, or specimens, or manuscripts, that he thinks will be useful to his fellow-botanists, prove him to be as liberal as he is enlightened.

OTIA HISPANICA; *seu Delectus Plantarum rariorum aut nondum rite notarum per Hispanias sponte nascentium, auctore* PHILIPPO BARKER WEBB, ORD. CAR. III. EQ. etc. Folio, 40 Plates. Paris. 1853.

It is strange that a country which has produced her Cavanilles and her Ruiz and Pavon, should not in the present day afford, at least as far as our knowledge goes, one Botanist able or willing to describe the plants of her own soil or of her diminished colonies. The task is left to foreigners, and it has happily fallen into the hands of most competent ones. Mr. Philip Barker Webb has completed his magnificent 'Flora Canariensis' (eminently magnificent if taken in conjunction with the

complete Natural and Civil History of which it forms a part); and to that gentleman and to M. Boissier we owe nearly all that has appeared of late years on the plants of the Spanish Peninsula. In the work now under consideration, Mr. Webb, as in his other publication, unites the elegant scholar with the Botanist: the former qualification is eminently displayed in the dedication to the reigning Queen of Spain.

"Augustissimæ et potentissimæ
ISABELLÆ II.
Dominæ suæ mitissimæ
Epistola Nuncupatoria.

Fas erat Elysiis mihi cingere frondibus aras,
Partaque Atlantiacis spargere serta jugis
Ante pedes, AUGUSTA, tuos; nunc altera regnis
Hæc tibi lecta tuis dona novella fero.
Parva quidem magno pro munere munera mitto;
Parva tamen divis, si modo pura placent.
Ibis in Hesperiam, tibi diva patrona, libelle,
Se DOMINA his voluit floribus ipsa coli."

Allusion is made above, we presume, to the fact of the presentation of a copy of the 'Flora Canariensis' to Her Majesty, upon which occasion the author was justly complimented with the Order of Charles III., an Order we believe the first in Spain after those given to Princes.

The 'Otia Hispanica' was commenced by Mr. Webb a few years ago, and two fasciculi appeared in large folio, which we noticed in a former volume of our Journal of Botany. The praise we there bestowed may with equal justice be extended to the entire volume, as it appears in its present form, with its many beautiful plates by Mlle. Taillant, from drawings by Riocreux, with copious analyses, all that can be desired by the most scientific Botanist. The *Leguminosæ* are evidently favourites with Mr. Webb, judging from the proportion they bear in number to the other families. One coloured plate, headed Tab. VI–X. (containing five species), is devoted to *Algæ;* and these are elaborated by the veteran Phycologist Dr. Montagne. The other remarkable plants illustrated in this volume, of which full descriptions and notes are given are,—1. *Holcus cæspitosus*, Boiss. 2. *Artemisia Granatensis*, Boiss. 3. *Cytisus tribracteolatus*, Webb. 4. *Adenocarpus Boissieri*, Webb. 5. *Salsola genistoides*, Poir.; and we have further a "Chenopodiarum

itineris Hispaniensis Revisio." 11. *Andryale Agardhii*, Hæus. 12. *Echium albicans*, La Gasc. et Rodr. 13. *Santolina rosmarinifolia*, Mill. *β. leptocephala*, Webb. 14. *Luteola complicata*, Webb. 15, 16. *Boelia* (nov. gen.) *sphærocarpa*, Webb. 17. *Retama monosperma*, Boiss. (with a revision of the genus). 18. *Stauracanthus aphyllus*, Link. 19. *S. spartioides*, Webb. 20. *S. spectabilis*, Webb. 21. *Nepa* (Ulex § Pseudo-genista, Coss.) *lurida*, Webb. 22. *N. Webbiana*, Coss. (sub Ulice). 23. *N. Cossonii*, Webb. 24. *N. Boivini*, Webb. 25. *N. megalorites*, Webb. 26. *N. Salzmanni*, Webb. 27. *N. Vaillantii*, Webb. 28. *N. Escayracii*, Webb. 29. A, B. *Ulex Africanus*, Webb. C. *U. parviflorus*, Pourr. 30. *U. Bœticus*, Boiss. 31. *U. Bourgæanus*, Webb. 32. *U. scaber*, Kze. 33. *U. ianthocladus*, Webb. (and 35 B). 34. *U. Welwitschianus*, Planch. 35 A. *U. Willkommii*, Webb. 36. *U. Jussieui*, Webb. A. *U. opistholepis*, Webb. 37. *U. densus*, Wellw. 38 A. *U. argenteus*, Wellw. B. *U. erinaceus*, Wellw. 39. *Sarothamnus grandiflorus*, Webb. 40. *S. Bœticus*, Webb. 41. *Carex lagopina*, Wahl. 42. *Lepidium stylatum*, La Gasc. et Rodr. 43. *Euzomodendron Bourgæanum*, Coss. 44. *Pinguicula vallisneriæfolia*, Webb. 45. *Forskählea Cossoniana*, Webb.—Interesting and well represented and accurately described, with the geographical distribution carefully recorded, as are all the above species, the several *Ulices*, from their great similarity to each other, are perhaps the least attractive; while the most remarkable and curious assuredly are the three last plants in the volume, viz. *Euzomodendron Bourgæanum* (a new genus of *Cruciferæ*), the *Pinguicula vallisneriæfolia*, with long, erect, lanceolate leaves and very long spurs to the corolla, and the *Forskählea Cossoniana*, a new species as well as a new genus to the European Flora.

The Scottish Florist and Horticultural Journal. Edinburgh. Small 8vo.

Of this work ten numbers have appeared without any editor's name; and so unbotanical are the subjects, so entirely confined, as the title-page expresses, to *Floral* and *Horticultural* matter, that any particular notice would hardly be looked for by our readers.

Descriptions of and observations on some Species of Rhododendron, *collected in Assam and Bootan by* Thomas J. Booth; *by* Thomas Nuttall.

Rhododendron proper.—Having an obscure or well-developed 5-toothed or 5-lobed calyx, usually 10 stamens, and a filiform slightly lobed stigma: the ovary and capsule generally of 5 cells.—To this division may be referred, in sections, all the European, North American, Northern Asiatic, and many of the Indian species.

* *Leaves with glandular scales. Stigma mostly capitate. Ovary five-rarely six-celled.*

1. Rhododendron Keysii, *Nutt.*

Fruticosum: foliis ovato-lanceolatis acutis glabris, subtus glaucis squamosis planis; floribus parvis; corymbulis 5–6-floris; laciniis calycinis subæqualibus obtusiusculis minutis; staminibus 10, filamentis exsertis basi pilosis; capsulis cylindraceo-ovatis 5-locularibus; seminibus lanceolatis immarginatis.

Hab. Mountains of Bootan, at an elevation of 9–10,000 feet above the sea-level. On the summit and northern ridges of the Lablung.

A hardy shrub, growing to the height of 2 or 3 feet, and forming low thickets, accompanied by Gaultherias and stunted Yews, above the range of *R. Hookeri* and *R. Falconeri*, and associated with one of our parasitic species allied to *R. camelliæflorum.*—Leaves 2½–3 inches long, about an inch wide, opake, coriaceous, and smooth, lanceolate or lanceolate-ovate, acute, rounded or narrowed towards the petiole, beneath, as well as the capsule, almost covered with brown circular resinous scales. Corymb compounded of three or four branchlets, each containing five or six flowers. Calyx five-toothed, small, the teeth nearly equal and obtuse. Corolla (judging from the withered remains only) rather small, apparently tubular or urceolate, the border five-lobed and reflected; the segments ovate, obtuse. Stamens ten, exserted apparently beyond the corolla, lower half of the filament very hairy or hirsute, as well as the lower half of the style. Anthers with the usual truncated pores. Capsule light brown, ovate-cylindric, obtuse. Seeds dark brown, scarcely subulate, and without the usual margin.

Rather aromatic, from the resinous scales with which the leaves are clad beneath. Perfectly hardy, during the winter and spring of 1851

and 1852. In its native hills it grew amidst snows two to three feet in depth. It is evidently allied to *R. Roylei* and *R. cinnabarinum.*

2. Rhododendron pumilum, *Nutt.*

Fruticosum: foliis ellipticis glabris apiculatis basi cuneatis brevissime petiolatis, subtus glaucis squamosis; corymbis 7–10-floris, floribus longissime pedunculatis; calycibus majusculis, laciniis ovalibus obtusis coriaceis; capsulis 6-locularibus arcuatis; seminibus utrinque subulatis.

Hab. Bootan, at 7–8000 feet elevation, with *R. Hookeri*, and almost on the range of *R. Falconeri*, on the high slopes of the Oola hills and edges of ravines, accompanied by a species of *Primula.*

A slender alpine branching shrub, growing to the height of about $1\frac{1}{2}$–2 feet. Bark of the older twigs smooth, white, and shining. Leaves in the young plants more or less hairy; in the adult smooth, about 3 inches long, by somewhat more than an inch in width, coriaceous, but thin, with the nerves or vessels scarcely visible either above or beneath, elliptic-oval, and cartilaginously apiculated, beneath glaucous, and scattered over rather thinly with minute resinous scales; base of the leaf cuneate. Petiole very short and thick. Bud-scales nearly smooth, rounded, obtuse and scarcely ciliated. Corymb composed of about seven to ten flowers; the peduncles slender, about $1\frac{1}{4}$ inches long. Calyx rather large; the segments rounded, oval, coriaceous, and nearly smooth. Capsule six-celled, light brown, scaly, curved as in *R. campylocarpum*, about $\frac{3}{4}$ of an inch in length. Seeds darkish brown, subulate at both extremities, with little or no margin. Flower as yet unknown, but the plant is introduced.

Apparently allied to *R. Roylei*, but very distinct in the six-celled curved capsule, long slender peduncles, and conspicuous unequal-lobed calyx.

3. Rhododendron formosum? *Wallich.*

A small epiphytal as well as terrestrial shrub, occurring in similar situations with *R. Nuttalii*, upon large forest-trees in the marshes of the Papoo.

§ Cleiodendron.—*Stigma capitate, entire or lobed. Stamens ten. Ovary five- or six-celled. Segments of the calyx large. Junior or adult leaves more or less hairy and scaly. Parasitic trees or shrubs.*

783 4. RHODODENDRON NUTTALII, *Booth.*

Arboreum: foliis maximis coriaceis ovalibus utrinque obtusis apiculatis, subtus valde reticulatis fusco-squamosis; floribus maximis; corymbis 4–6-floris; lobis calycinis crassiusculis oblongo-ovalibus obtusis; corolla subcampanulata; staminibus 10; capsula 5-loculari, calyce persistente $\frac{2}{3}$ tecta; seminibus pallidis, ovato-lanceolatis, lato-marginatis, marginibus erosis.

HAB. In the Duphla hills at Meré Patar, about Seram's village, on the banks of the Papoo. In swampy ground, growing with Yews and Oaks at an elevation of 4–5000 feet above the sea-level.

A tree 30 feet in height; and also a parasite of 12 or 13 feet elevation, and then straggling, with thick tuberous roots. Young branches and the under surface of the leaves covered with circular peltate radiating resinous scales, of two kinds, the larger, in the expanding leaves, of a bright purple-red or pink colour. Young plants but little hairy (compared with those of *R. Dalhousiæ*). Leaves 6–8 inches long, $2\frac{1}{2}$–4 inches wide, of a very thick coriaceous substance, so as to be quite opake, oval and obtuse, smooth above, except in the young state, very strongly veined and reticulated beneath, and scarcely paler than above; in adult leaves brown, with the numerous resinous scales. Flower-cone a little more than 2 inches long, by $1\frac{3}{4}$ inches wide; the scales thick and coriaceous, with silky margins internally. Stipules oblong, membranaceous, pink-red. Corymb four- to six-flowered; peduncles very stout, about 2 inches long in the fruit, less than an inch in the flower. Calyx-segments thick and opake, oblong-oval or ovate, obtuse, slightly ciliated, and with the margins rose-red, an inch in length, enlarging in the fruit, when they become scarcely a third shorter than the capsule. Corolla subcampanulate, the border spreading, five-lobed, white with a tint of rose-red, and yellowish at the base within, $4\frac{1}{2}$–5 inches long, fragrant. Stamens ten; the filaments villous below. Style very long; the stigma large and capitate, five-lobed. Capsule light brown, five-celled, about 2 inches long by an inch wide, the valves rounded and slightly carinated; placental dissepiments very deep. Seed very pale brown or straw-colour, ovate-lanceolate, acute, with a wide eroded margin.—In *R. Dalhousiæ* the seed is dark brown, lanceolate, acute at both extremities, and the margin entire.—Allied to *R. Dalhousiæ*, but larger in all its parts, and with the calyx, capsule, and seed wholly different.

To this section also appertains *R. ciliatum.*

5. Rhododendron Boothii, *Nutt.*

Fruticosum: foliis coriaceis rhomboideo-ovatis latis acuminatis, margine dense ciliatis, subtus squamosis; corymbis multifloris; calycibus foliaceis membranaceis, laciniis ovalibus obtusis glabris; capsulis ovalibus obtusis 5–6-locularibus; seminibus subulatis immarginatis.

Hab. On the Gascherong hills in Bootan, at an elevation of about 5000 feet; parasitic on Oaks, and accompanied by *Thibaudias*, a new species of arborescent *Hydrangea*, etc.

A straggling shrub, 5–6 feet high. Young branches and petioles at first densely hairy. Leaves very thick and coriaceous, between 4–5 inches long and 2–2½ inches wide, acuminate, with a sharp longish point, and rounded at the base; the margin only, in adult leaves, thickly set with longish brown hairs, beneath thinly covered with small brown scales, just visible to the naked eye. Bud-scales smooth, brown, dilated and rounded, with a small point, and the margins with a silvery ciliation. Corymb of seven or eight flowers (in the only specimen I have seen). Segments of the calyx large, nearly the third of an inch long, leafy, rigid, smooth and membranaceous, oval and obtuse. Capsule light brown, with a thick wrinkled epidermis, two-thirds of an inch long, oval and obtuse, five- but mostly six-celled. Seeds numerous, dark brown, subulate, and nearly without any margin. Leaves in young plants wholly hairy.

A fine and very distinct species, occurring at a lower elevation than most of the Bootan species. Where it grew however the thermometer fell at nights occasionally to the freezing-point. By the calyx and other characters (in the absence of flowers), it appears to be allied to *R. Edgworthii.*

6. Rhododendron Dalhousiæ, *Hook. fil.*

Epiphytal, growing on the lower ranges of the Lablung with a variety of

7. Rhododendron Edgworthii?

This latter species is also an epiphytal shrub, differing from the plants figured in having usually two of the upper divisions of the calyx larger and dilated. Being, as yet, ignorant of the flower, we cannot tell whether any other differences may occur, worth notice. They both grow in a region in which Oaks thrive. *R. Dalhousiæ* appears also to

have been found by Griffiths in Bootan, according to a bad specimen in seed in the herbarium of Sir William Hooker.

This species forms a second section, having a distinctly lobed stigma and a six-celled capsule.

§ Calodendron.—*Stigma filiform. Ovary six- to ten-celled. Calyx usually minute. Mostly trees or large shrubs, with the flowers in dense corymbs.*

8. Rhododendron Windsorii, *Nutt.*

Arboreum: foliis coriaceis, obovato-lanceolatis, acutis, in petiolum attenuatis, glabris, subtus argenteis, demum rufescentibus; capitulis multifloris, bracteis sericeis; calycis lobis brevissimis; corolla punicea, lobis emarginatis; staminibus 10; capsulis cylindraceo-oblongis glabris 10-locularibus; seminibus lanceolatis subulatis.

Hab. In the mountains of Bootan, growing at an elevation of 7–9000 feet above the sea, on the ridges and slopes of Roophrye, in exposed and arid situations, with Pines, species of *Cupressus*, *Berberis*, etc.

Becoming a small tree, with coriaceous leaves, obovate-lanceolate and acute, 4–5 inches long, 1–1½ broad, strongly reticulated, and pinnately nerved, shining-white and silvery beneath, at length pale brown. Heads many-flowered, crowded; the bracts dilated and silky; lobes of the corolla all emarginate, the colour a deep crimson-scarlet, rather deeper-coloured than in *R. arboreum*, to which this species is nearly related. It is more particularly allied to *R. roseum* of the gardens, but different in the foliage and colour of the flower. The calyx is minute; stamens 10. Capsule at length smooth, oblique at base, ten-celled.

An abundant and very variable species; the leaves sometimes lucidly shining; in other individuals dull, or clothed more or less with golden yellow pulverulent deciduous down: in form also varying from almost obovate to lanceolate or elliptic-lanceolate.

β. leucanthum; foliis elliptico-lanceolatis opacis, floribus albis.

This variety, or almost species, is readily distinguished by its more lanceolate leaves, of an opake dull green above, but, like the former, beneath, passing at length from a silvery-white to a pale brown; the flowers are also constantly white.

Both these varieties appear to be hardy in this part of England (Lancashire); as a plant of the former stood out all the last winter, though but a small seedling.

γ. *angustifolium;* foliis lanceolatis angustatis utrinque acuminatis, junioribus pubescentibus.

Apparently a distinct species. The leaf very narrow lanceolate, and, as yet, not discoloured beneath; for a considerable time pubescent. Seemingly also the produce of a curved capsule.

To this section may also be referred *R. fulgens*, *R. Wightii*, *R. niveum*, *R. arboreum*, *R. Nilagiricum*, *R. Campbelliæ*, and *R. cinnamomeum*.

Named in honour of my early botanical friend Dr. John Windsor, of Manchester.

9. Rhododendron Kendrickii, *Nuttall*, in Annals and Magazine of Nat. Hist. vol. xii. no. 67. p. 10.

Frutex ramosus: foliis oblongo-lanceolatis acuminatis, glabris, concoloribus, margine leviter undulatis, junioribus pubescentibus; corymbis multifloris; laciniis calycinis minutis acuminatis; staminibus 10? filamentis glabris; capsulis arcuatis, glabris, 6-locularibus; seminibus lanceolatis, utrinque acutis.

Hab. Mountains of Bootan, about 7000 feet elevation, accompanying *R. Edgworthii*, and found lower down than *R. Hookeri* and *R. eximium*, but above *R. Windsorii;* accompanied by Pines and Yews.

This fine species, having some affinity with *R. arboreum*, forms lofty thickets after the manner of *R. ponticum*, through which the traveller finds dark and difficult paths. The stem attains the diameter of 7 or 8 inches, with a smooth pale bark. The leaves, 4–6 inches long, are scarcely more than an inch wide, elegantly waved on the margin in small plaits, so as to appear almost crenate, disposed partly in whorls, equally green and smooth on both surfaces when adult; the petiole less than ½ an inch in length; the young leaves and stems, in young plants, more or less clothed with reddish glutinous hairs, beneath shining, with the pubescence chiefly confined to the midribs. Flower-cone oval; the scales smooth, rounded, and obtuse; innermost scales or bracts silky. Corymb ten- to twelve-flowered. Flowers large, deep red. Stamens ten? smooth. Stigma five-lobed. Calyx small, as in *R. arboreum;* the segments broad, ovate, acuminate. Capsule 1–1¼ inch long, incurved, six-celled, smooth, and dark brown. Seed small, darkish-brown, lanceolate, oblique, acute at both extremities.

Found to be hardy in the climate of England. It grows promiscuously with the very hardy *Pinus excelsa*, and with several kinds of un-

described Oaks. Fresh flowers have not yet been seen, but from the appearance of the dried fragments they seem to be of a deep red. Since the above remarks were made, a plant in cultivation has made an abortive attempt at flowering, producing two stamens and a cluster of scarlet leaves.

There are apparently two varieties: one with a glutinous pubescence; the other with appressed short strigose hairs.

According to the herbarium of my friend Sir William Hooker, it appears that this species was observed in Bootan by the late Mr. Griffiths. The specimens are branches without flowers or fruit.

Dedicated to the memory of my much-revered friend and botanist the late Dr. James Kendrick, of Warrington.

§ Eurhodium.—*Calyx campanulate, large, coloured, indistinctly lobed. Stamens ten. Stigma filiform. Capsule conic-ovoid, six- to eight-celled. Large shrubs, with smooth leaves, and brilliant flowers in corymbs.*

10. Rhododendron Hookeri, *Nutt.*

Fruticosum, erectum: foliis coriaceis glaberrimis rigidis oblongo-ovalibus obtusis, longe petiolatis, basi rotundatis, subtus glaucescentibus pinnatim nervosis; nervis furfuraceo-pubescentibus; corymbis multifloris; calyce amplo campanulato, obsolete et inæqualiter lobato; corolla campanulata, lobis emarginatis; staminibus 10; capsula cylindraceo-ovata glabra 7–8-loculari; seminibus lanceolatis marginatis, apice laceratis.

Hab. Bootan. Along with *R. eximium*, solely forming thickets over the Oola mountain, on the northern slopes of the Lablung Pass; accompanied by *Pinus excelsa*. The frost and snow at that time, about the 20th of December, being very severe and continuous. Elevation above the sea-level, 8–9000 feet.

A tall erect shrub, 12–14 feet high, with a stem 3–4 inches in diameter. Branches covered with a whitish-yellow polished bark. Flower-buds large, the scales dilated and retuse, externally appearing as if varnished, internally silky. Leaves smooth, very thick and coriaceous, apiculate, oblong or oblong-oval, obtuse at both extremities, beneath glaucous, elegantly and curiously pinnately nerved, the nerves or vessels in right lines marked at regular distances by globular tufts of white chaffy scales, which, when abraded, leave behind brown fibrous tufts,

resembling the basis of the sori in Ferns, both in texture and colour. Inner bud-scales, in growing plants, linear-oblong, much elongated, and often of a brilliant scarlet. Leaves 3–5½ inches long, and from 1–1½ inches wide; during winter very much curled back, so that the edges nearly meet the midrib. Petiole thick and stout, about an inch in length. The flower (judging from dead fragments) as large as that of *R. Thomsoni*, to which the species is so much allied; the lobes five, deeply bilobed. Stamens ten, smooth; the anthers with oblique pores. Corymb ten- to fifteen-flowered; the peduncles reflected. Calyx very large, campanulate, coloured, unequally and irregularly five-lobed, the two back lobes the largest, all of them shallow; capsule about an inch long, seven- to eight-celled, two-thirds covered by the persistent coriaceous calyx; capsule light brown, cylindric-ovate, the cells acute, placental dissepiments very thick and rounded. Seed lanceolate, light brown, with a margin chiefly on one side, and the summit torn into several threads.

Dedicated to Dr. Joseph Dalton Hooker, who has contributed so eminently to the illustration of the Rhododendrons of Northern India.

A very distinct species, but closely allied to *R. Thomsoni;* distinguished at once by the very different leaves and their peculiarities, as well as by the more numerous-flowered corymb.

11. Rhododendron Shepherdii, *Nutt.*

Fruticosum: foliis coriaceis oblongo-ellipticis acutis glabris, subtus concoloribus, basi rotundatis leviter pinnatim nervosis, brevi-petiolatis; calyce? corolla?

Hab. In Bootan. The capsules are mixed up with those of *R. Hookeri*, with which they must have been inextricably blended; and hence it is very probable that they will be found somewhat similar to those of that species. It grew therefore with *R. eximium*, on the Oola Mountain.

The young leaves are beneath of a deep purple-red. The adult leaves 3–4 inches long, by about an inch wide, slightly pubescent on the underside of the short thick petiole, elliptic-oblong, acute, very thick and opaque, beneath slenderly feather-nerved. Buds sharply conic, and very smooth, the scales green and dilated, ovate.

Named in honour of Mr. Henry Shepherd, of the Liverpool Botanic Garden.

§ LIRIOTHAMNUS.—*Calyx coriaceous, spreading, circular or oblong, obsoletely lobed. Corolla nearly regular, spreading. Stamens twelve to eighteen, disposed in a circle. Stigma capitate. Capsule about twelve-celled.—Large shrubs, with, at length, smooth leaves, and few large white flowers.*

12. RHODODENDRON AUCKLANDII? *Hook. fil.*,

or *R. Griffithii*, Hook. fil., bearing an almost circular peltate calyx, of which the flower is yet unknown; grows to be a large straggling shrub, 10–20 feet high. On the slopes of the Oola mountains, at an elevation of about 8000 feet above the sea. Of this, from growing plants, there appear to be two or three varieties.

§ SARCODENDRON*.—*Calyx five-lobed, lobes more or less coriaceous or membranaceous. Corolla with the lobes nearly equal and regular. Stamens sixteen to twenty. Stigma capitate. Ovary five- to ten-celled. Capsule conic.—Shrubs, with smooth succulent leaves and branches, more or less clothed with radiated glandular scales. Flowers few, or solitary.*

* *Flowers funnel-shaped.* (MADDENIA.)

13. RHODODENDRON JENKINSII, *Nutt.*

Fruticosum: foliis brevi-petiolatis, oblongo-lanceolatis, acutis, basi cuneatis, subtus glaucis dense squamosis; corymbis 4–6-floris; calycis laciniis brevibus, lobis subæqualibus, rotundatis, obtusis; stylo longissimo; capsulis cylindraceo-ovatis, 10-locularibus; seminibus lanceolatis, acuminatis, immarginatis, basi obliquis.

β. *aciphyllum;* foliis oblongo-lanceolatis subacuminatis angustatis, basi cuneatis.—Allied to *R. Maddeni*, but the leaf narrower and not so acuminate, the scales, also, on the underside of the leaf, much larger.

γ. *platyphyllum;* foliis oblongo-ovatis, planis, obtusiusculis, basi rotundatis.—A very wide-leaved variety, the leaf sometimes oval.

δ. *undulatum;* foliis oblongo-lanceolatis, cuneatis, undulatis, acutiusculis.—The leaf strongly waved, rather narrow, and very shining.

These varieties all occur blended with the original species.

HAB. In Bootan, on the southern slope of the Oola mountain, at about an elevation of 6–7000 feet above the sea-level, growing a little

* In allusion to the fleshy succulent texture of these species.

above *R. Aucklandii*, dispersed, and not forming masses, being apparently a scarce species in this locality, accompanied by *Pinus excelsa*, etc.

A fine shrub, 6–7 feet in height; branches covered with a whitish shining bark. Young branches thick, succulent, and of a bright red. Leaves coriaceous and shining above, oblong-lanceolate and acute, usually cuneate below, 4–5½ inches long, 1–1½ inch wide, beneath at first glaucous, but at length brown, from a dense clothing of somewhat resinous scales; petioles thick, about three-fourths of an inch long, and with the midrib very stout; lateral vessels or ribs nearly hidden in the thick substance of the leaf. Flower-buds large and broad, conic, the scales yellow, thick, and dilated, with membranous margins, all of them smooth, without any ciliation. Corymb from four- to six- mostly five-flowered; peduncles about three-fourths of an inch long, very thick. Calyx small, the segments nearly all equal, ovate or oblong, with broadish membranaceous margins. Corolla not seen. Style about 3 inches long; stigma large, ten-lobed? Capsule about an inch long, conic-ovate, woody and stout, very scaly, ten-celled, each of the partitions of the placental dissepiment longitudinally cleft. Seed dark brown, lanceolate, subulately acuminate, oblique and pedicellated at the base.

This species, according to a specimen without flower or fruit, in the herbarium of Sir William Hooker, was also found by the late indefatigable Mr. Griffith on the Khasya hills. As a species it is allied to *R. Maddeni* of Dr. Hooker, and these, along with *R. sparsiflorum*, Nutt., *R. camelliæflorum*, Hook. fil., *R. lucidum*, Nutt., and the following, have a very peculiar aspect, all agreeing in their smooth lepidote leaves and succulent texure.

Named in honour of Major Jenkins, of the East India Service, who has done so much for the botany of that country.

14. Rhododendron calophyllum, *Nutt.*

Fruticosum: foliis brevi-petiolatis, oblongo-ovatis, subellipticis, acutis, basi subrotundis, subtus glaucis squamosis; corymbis 4–5-floris; calycis laciniis brevibus, lobis subæqualibus obtusis; capsulis cylindraceo-ovatis obtusis 10-locularibus.

Hab. In Bootan, with *R. Jenkinsii*, from which it is perhaps not sufficiently distinct, though readily distinguished by the eye. The

flowers of both are yet unknown, the specimens having been collected in the month of December. Mr. Booth supposed, from the examination of the buds, that *R. Jenkinsii* would have yellow flowers; in the present species the bud-scales, in three specimens, are reddish-purple, indicating probably a red flower. The leaves are 3½–4 inches long, about 1½ inch wide, pointed, but not acuminate, also less scaly beneath.

*** Flowers spreading; with a short tube.*

15. RHODODENDRON SPARSIFLORUM, *Nutt.*

Fruticosum: foliis ovalibus, utrinque obtusis, glabris, apiculatis, brevissime petiolatis, subtus dense squamosis; floribus subsolitariis; calycibus majusculis, laciniis oblongo-ovalibus margine membranaceis; capsulis ovatis, 5–8-locularibus; seminibus lanceolatis, acuminatis, basi obliquis.

HAB. Bootan. According to Mr. Booth, accompanying *R. Keysii*, and growing at the same elevation.

A shrub, 2–3 feet high. Branches divaricate, the younger ones glutinous. Leaves nearly oval, or sometimes obovate, usually obtuse at each extremity, 3 inches long by 1¾ inch wide; in a young state somewhat scaly above, beneath covered with brown scales; uppermost leaves nearly sessile. Flowers one or two together. Calyx rather large for the flower. (Flower not seen.) Capsule scaly, ovate, acute, five- to eight-celled. Seeds lanceolate, acuminate, oblique at the base, nearly immarginate, dark brown. Closely allied to *R. camelliæflorum*, but different in the foliage: perhaps, however, as supposed by Dr. Hooker, nothing more than a variety of that species. Flower-cone with the scales partly leafy.

16. RHODODENDRON CAMELLIÆFLORUM, *Hook. fil.*

Some variety of this species, with oblong-lanceolate leaves, was found by Mr. Booth as an epiphytal shrub in the valley of Lablung.

Of this species we have living plants, but as yet are unacquainted with the flower. A second apparent variety, also living, has a stem and foliage almost as robust as *R. Jenkinsii*, but has not the red twigs of that species; with the flower of this we are equally ignorant.

17. RHODODENDRON LUCIDUM, *Nutt.*

Fruticosum: foliis brevi-petiolatis oblongo-lanceolatis acutis nitidis

basi cuneatis, subtus glaucis squamulosis; floribus subsolitariis; calycis laciniis majusculis oblongo-ovalibus obtusis, glabris; capsulis ovatis acutis 5–8-locularibus.

Hab. On the mountains of Bootan, beyond the Bhorelli, accompanying Pines and other hardy plants of the higher regions.

A scarce shrub, hardly distinguishable from *R. Jenkinsii* by the leaves, although so very distinct in the inflorescence, which approaches nearer to that of *R. camelliæflorum*. The flowers we have not yet seen.

To the first part of this section we should also refer *R. Maddeni*.

§ Sciadendron*.—*Calyx obsolete, crenate. Corolla campanulate, the border eight- to ten-lobed. Stamens twelve to eighteen (rarely ten). Stigma capitate, lobed. Capsule twelve- to eighteen-celled. Seeds with a dilated margin.—Shady trees, with unusually large leaves: flowers in large corymbs, white or lilac-purple.*

18. Rhododendron eximium, *Nutt.*

Arboreum: foliis maximis, coriaceis, obovalibus, obtusis, basi rotundatis, demum glabris reticulatis, subtus ferrugineo-lanatis; corymbis multifloris (12–18) subracemosis; pedunculis elongatis; floribus maximis marcescentibus; calycibus obsoletis crenatis; corolla 10-lobata; staminibus . . . ? capsulis viscosis, oblongo-cylindraceis, obtusis, 12–16-locularibus; seminibus subellipticis, lato-marginatis, erosis.

Hab. In the forests of Bootan, on the rocky ridge and spurs of the Oola mountains, 10–11,000 feet above the sea-level; growing amidst ice and snow; often becoming a very umbrageous stately tree, 30 feet in height, forming thickets and also straggling; the branches leafy at the summits.

Leaves oval or oboval, very large, on long petioles, 12–18 inches long by 6–8 inches broad, obtuse at both extremities, slightly apiculate, rounded and rather narrowed below; at first covered above as well as below with dense ferruginous woolly pubescence; beneath pinnately nerved and obscurely reticulated. Buds as large as a moderate-sized apple, with dilated ferruginous woolly long acuminated scales. Corymb with an elongated racemose column; flowers twelve to eighteen; peduncles 2–3 inches long, at length nearly smooth. Corolla not seen, except in a marcescent persistent state. Capsule very large, cylindric-

* In allusion to the large leaves and consequent shade.

obovate, obtuse, twelve- to sixteen-celled, glutinous, but not pubescent, 2 inches long, by about 1 inch wide. The flower quite equal in size to the magnified figure (fig. 2) of the flower of *R. Falconeri*, given by Sir William Hooker on plate 11 of the 'Rhododendrons of Sikkim-Himalaya.' It was no doubt taken by Dr. Hooker for a variety of *R. Falconeri*. The loose fewer-flowered corymb and longer more pubescent leaves, as well as the fewer-celled capsule, seem to distinguish it. It is nearly the most majestic tree of the genus; allied to it, no doubt, will also be the following, of which I, as yet, know only the leaves of two plants, brought as well as the preceding from Bootan by Mr. Booth.

19. Rhododendron venosum, *Nutt.*

Arboreum: foliis elliptico-ovatis subdilatatis, basi rotundatis angustioribus, pulverulentis, demum subglabris, subtus albis, reticulatis, adpresso-tomentosis, penninerviis.

Hab. In the mountain forests of Bootan, beyond the valley of the Bhorelli river.

Apparently a tree. Leaves usually elliptic-ovate, acute, or sometimes approaching obovate, pulverulently tomentose for a considerable time, very strongly reticulated and pennately nerved both above and below; the pubescence below nearly white and close-pressed. Bud-scales dilated, nearly smooth, with short points. The flower is unknown.

This kind appears to have come up in several collections with the seeds of *R. Falconeri*, distributed by Dr. Hooker.

20. Rhododendron planifolium, *Nutt.*

Arboreum: foliis amplis, elliptico-ovatis acutis, basi rotundatis, planis, pulverulentis, pinnatim-nervosis, reticulatis, subtus subferrugineis, tomento intricato.

Hab. Mountain forests of Bootan. It appears also, from the herbarium of Sir William Hooker, to have been found by the late Mr. Griffith at Yalloong in the same country, growing at an elevation of 10,000 feet above the sea-level. The knobbed or clustered matting of the pubescence beneath is a very peculiar character.

A single living plant of this apparently fine species is, with the exception of the dried specimen above mentioned, all that I yet know concerning it: its spreading, wide, and large foliage gives it a peculiar

grace. It appears to be an arborescent species, like the preceding, to which it is nearly allied, and has very similar buds.

To this section will also be referred *R. Falconeri*, *R. Blumei*, *R. Hodgsoni*, *R. grande*, *R. argenteum*, and *R. longifolium*.

21. Rhododendron longifolium, *Nutt.*

Arboreum: foliis amplis prælongis, obovato-lanceolatis, in petiolum crassum attenuatis, planis, demum glaberrimis, subtus nitidis argenteis, reticulatis, costatis; bracteis sericeis; pedunculis brevibus; calycibus obsoletis brevissime lobatis; corolla . . .? capsulis maximis, oblongo-ovalibus, basi obliquis, glabriusculis, transversim rugosis, subsedecim-locularibus; seminibus ovalibus, lato-marginatis, erosis.

Hab. In the forests of Bootan, on the slopes of the Oola mountains at an elevation of 6500–7500 feet above the sea-level.

A tree, 30 feet high; the leaves 9–15 inches long, 2–4 wide in the middle, at first pubescent, at length smooth or nearly so, gradually narrowed downwards, obovate-lanceolate, silvery and whitish beneath, strongly reticulated as well as veined; buds very large. Capsule 2 inches long, about 1 inch wide, about sixteen-celled, oblique at base, transversely wrinkled, at length smooth. Seeds oval or elliptic, with a wide and torn border, light brown. Bud-scales of the leaves nearly smooth.

As a species, perhaps scarcely distinct enough from *R. argenteum;* the leaf however appears to be wider and more reticulated; nor does it show the inner red bud-scales of that species. With the flower, no doubt large, we are unacquainted. The capsule is larger than that of any other species, if we except that of *R. Nuttalii.*

To all appearance nearly hardy in this climate. The adult leaves almost resemble those of *Magnolia Umbrella!*

22. Rhododendron Blumei, *Nutt.*

Arboreum? foliis oblongo-ellipticis, acutis, basi rotundatis, subsinuatis, glabris, subtus penninerviis, argenteo-tomentosis, niveis, longe petiolatis, junioribus puberulis; calyce . . . corolla . . .

Hab. Bootan, on mountains beyond the Bhorelli river. Found also in Bootan by the late Mr. Griffiths, according to specimens in the herbarium of Sir William Hooker, where it was associated with *R. Hodgsoni* as a distinct variety, and with which, I think, were some scattered

flowers of that species. It is no doubt allied to it, but easily distinguished by the acute leaves, which are strongly pinnate-nerved, almost snow-white, and closely tomentose beneath. It appears also very nearly allied to *R. longifolium.*

Leaves 5–6 inches long, by about 2 inches wide, of a bright green above, and only puberulous in the young state before expansion. Stipules oblong, concave, abruptly apiculated, puberulous. It appears to be a scarce species in the localities yet visited. The flowers and fruit are not yet known with certainty, but will probably approach to *R. Hodgsoni.*

Mr. Booth obtained only a solitary living plant, and no seeds or flowers. Two or three plants of this species appear, however, to have come up with the seeds of *R. longifolium.*

I have dedicated this species to the celebrated Asiatic botanist, Blume.

Initiatory attempt to define the species of HEDYCHIUM, *and settle their synonymy; by* DR. WALLICH, V.P. Royal and Linn. Soc.

(*Continued from p.* 329.)

8. *H. gracile;* glabrum, omnibus partibus minutissime glanduloso-punctatum, foliis ovato-lanceolatis acuminatis, bracteis binis convolutis unifloris tubo parum brevioribus, laciniis limbi lobisque labelli fere bipartiti linearibus, stamine valde porrecto.

H. gracile, Roxb. Hort. Beng. p. 1. Corom. Plants, iii. p. 48. t. 251, fig. infer. dextra (folium tantum flosque dissectus). Flor. Ind. i. p. 12 (*c.* nota Careyi); etiam in Herb. Banks. Rœm. et Schult. Mant. p. 15. Add. i. p. 71. Spreng. Syst. i. p. 9. Dietr. Spec. i. p. 33. Dietr. Syn. p. 9. Wall. Cat. Herb. n. 6543.—*H. glaucum*, Rosc. Mon. Pl. n. 3. Spreng. Cur. Post. p. 6. Dietr. Spec. i. p. 34. Dietr. Syn. p. 9.

Patria. Montes Kasiani (præter coll. in Cat. Herb. enum.), *Mack et Griff. in Herb. Hook. Hook. fil. et Thoms.* Sikkim, *Hook. fil. cuj. etiam Ic. pictæ; item Cathcartii.*

All the parts of the plant, leaves, bracts, calyx, and corolla, even the filament, are marked with copious minute, globular, brown, and semi-pellucid glandular dots, visible only under the microscope; more particularly the parts of the flower. This punctuation exists in a greater or less degree in most if not all the species. I have before me a large

number of specimens in all stages, particularly those collected by Drs. Hooker and Thomson; which, although differing apparently among themselves, I am unable to distinguish even as varieties. Roxburgh's original plant seems to have been smaller than what is usual. The flowers are white or cream-coloured, with a long red stamen. In many of the specimens the spike is slightly nodding, rather it is ascending on a somewhat declined or decumbent stem; an appearance which has no value as a specific character, and which occurs very often, especially where the inflorescence is large and heavy.

9. *H. densiflorum;* glabrum, foliis ellipticis, bracteis unifloris, laciniis limbi interioribus cuneiformibus, labelli subsessilis ovato-lanceolati bifidi lobis acutis, stamine æquante, antherâ carnosâ dorso convexâ.

H. densiflorum, Wall. Cat. Herb. n. 6552.

Patria. Mons Shivapura, Napaliæ. Sikkim, ad elev. ped. 5–6000, *Hook. fil. cuj. Ic. picta.*

I am not quite confident that this is in reality distinct from *H. gracile*, as a species. The latter, however, has never been found either in Nipal, or on the mountains to the westward of it. The flowers are orange-coloured throughout.

10. *H. Gomezianum;* glabrum, glanduloso-punctulatum, foliis lanceolatis, nunc supra glanduloso-lineolatis, bracteis approximatis geminatis unifloris, calyce tuboque exsertis, laciniis limbi exterioribus angustissime linearibus interiores superantibus, labello cuneato bilobo, stamine longissimo.

H. Gomezianum, Wall. Cat. Herb. n. 6543. *Hedychium*, Griff. Notul. iii. p. 419 (prima species).

Patria. Tavoy, *Gomez.* Mirgui, *Griff. in Hb. Hook.*

Both Mr. Griffith (l. c.) and Mr. Gomez (according to his MS. Catalogue in the Linnean Society's Museum, n. 340) found this plant growing on trees. Dr. Hooker has occasionally seen some species in this sort of locality; Dr. Blume gives it to two of his species, and I have myself at times found decidedly terrestrial species growing both on trees and rocks. Still it is possible that our species may be really epiphytal. The spike seems to be slightly recurved or nodding, and the flowers ascending or one-sided; which appearance, if permanent, might be added to the specific character. According to Mr. Griffith the outer limb of the corolla is green, the inner white, and the stamen red or orange-coloured.

11. *H. Griffithianum;* foliis lanceolatis acuminatissimis punctis creberrimis linearibus inæqualibus parallelis obsitis, subtus pilosis, bracteis geminatis remotiusculis unifloris, calyce duplo vel triplo brevioribus, tubo valde exserto, limbi laciniis elongatis linearibus labelloque lanceolato bilobo deorsum longe attenuatis.

Patria. Kasia, *Griffith in Herb. Hook.* et *Lindl.*

There is a single specimen of this very remarkable plant in each of the two herbariums quoted. The nearest affinity is certainly with the immediately preceding species (*H. Gomezianum*), of which I can imagine it possible that it may hereafter prove only a variety. Can a mistake have occurred in regard to the label, and that Kasia was written instead of Mirgui? The crowded longitudinal, unequal, parallel glandular lines on the leaves, especially on the upper surface, are visible even to the naked eye. On the lower surface there is a number of long grey, easily soluble hairs, which are decumbent, and deceptively accrete within their base. Further, the very long calyx and still longer tube, and the exceedingly slender divisions of the limb, all dotted with globular glands, seem to point at a decided specific distinction.

12. *H. Gardnerianum;* foliis ellipticis subtus, imprimis spicâ intense furfuraceo-glaucis, bracteis convolutis 1–2-floris, labello ovali subsessili integro vel bidentato, nunc suborbiculato, stamine longissime porrecto.

H. Gardnerianum, Wall. Ic. pict. duæ in Mus. Procur. Ind. Or. Spreng. Cur. Post. p. 6. Dietr. Sp. p. 35. Dietr. Syn. p. 9. Bot. Reg. ix. n. 774 A *et* B. Rosc. Monand. Pl. n. 62. Griff. Notul. iii. p. 419 (ad exempl. in caldar. Comitissæ de Vandes flor.).—*H. speciosum,* Wall. in Roxb. Ind. i. p. 13. Cat. Herb. n. 6550. Pl. Asiat. Rar. iii. p. 51. tab. 285; etiam in Herb. Banks. Rœm. et Sch. Mant. p. 16. Add. i. p. 71. Spr. Syst. i. p. 9. Dietr. Sp. p. 35. Dietr. Syn. p. 10. Hook. fil. Ic. duæ pict.

β. labello suborbiculato unguiculato integro vel bilobo.—*Wall. Ic. pict. in Mus. supra mem. Cathcart, Ic. pict.*

γ. labello subquadrato bilobo unguiculato.—*H. Roscoei,* Wall. apud Roscoeum l. c. in observ. generi prefix.; et Ic. in Museo mem. Dietr. Sp. p. 37. Dietr. Syn. p. 10.—*H. aurantiacum,* Wall. Cat. Herb. n. 6551 et Ic. pict. duæ in Mus. citat.—*Hedychium,* Griff. Op. Posth. ii. p. 35?

Patria. Napalia. Sikkim ad alt. ped. 6000, *Hook. fil.* Jug. Ka-

sian., *Mack et Griff. in Hb. Hook.* *Hook. fil. et Thoms.* β. Napalia. Sikkim, *Cathcart, Ic. pict.* γ. Napalia.

This is the queen of the genus, if not of the whole order, both as regards the general aspect, the stature and foliage, and the exquisite elegance as well as fragrance of the ample inflorescence. While I write this, several large patches of the typical form are in full bloom at the Horticultural Society's Garden at Chiswick, thriving luxuriantly in a temperate glass-house, without any extraordinary supply of water; and last year I saw them in equal perfection. What can be the reason that a plant so charming and desirable as this, is not more frequently seen in the stoves of the great and wealthy? Surely there exists not an Orchidea which exceeds it in any respect, especially in facility of cultivation. I regret to say, the figure in my 'Plantæ Asiaticæ Rariores' does by no means justice to the plant, the original drawing having been taken from the first specimen that was sent down to me by post, from the Kasia range, by the late Mr. M. R. Smith, nearly forty years ago. The magnificent series of specimens, even as to colour, preserved by Drs. Hooker and Thomson, with the fine drawings of the former and the excellent figure in Roscoe's work, prove that my *H. speciosum* and my *H. Gardnerianum* are identically one and the same species. I retain the latter name, being that of a very valued and honoured friend, who, himself ardently attached to flowers and gardening, has done a great deal of service to the cause of botany in its most extended sense. During a number of years in which the Hon. Edward Gardner (son of the late distinguished Admiral Lord Gardner) lived in Nipal, as the Hon. East India Company's Resident at the Court of Katmandu, he contributed greatly to the riches of the Botanic Garden of Calcutta, and through it, to the gardens and herbariums of England. It was through his local influence, and afterwards also of the late Mr. Robert Stuart's, the officiating Resident*, that I was permitted to send permanent collecting parties into that country, where they enjoyed his unceasing support and encouragement; and afterwards to visit it myself during a whole year, which I spent under his friendly and hospitable roof†. Would that the cause of Natural History could boast

* See my note to *Primula Stuartii*, Roxb. Flor. Ind. ii. p. 20.

† In 1820 I had the satisfaction to dedicate a very remarkable genus of plants to that distinguished benefactor of Indian Botany, which was first published in Roxburgh's Fl. Ind. i. p. 400, and ii. p. 317 and 318. In this second volume, as well as in my Plantæ Asiaticæ Rariores and the Catalogue of the East Indian Herbarium,

many such Mæcenases in India and everywhere else!—The plant varies strikingly in the shape and size of the labellum, as also in the general colour of the flower, which from a bright yellow becomes pale, or changes into white with a pinkish centre in β (the only instance in our genus of that colour, with which I am acquainted), according to Mr. Cathcart's drawing. It is orange in γ. I have only given the above-mentioned varieties, as an abstract of the manifold changes to which this noble species is liable.

13. *H. Sieboldii;* foliis ellipticis subtus, bracteis convolutis remotiusculis multifloris, calyceque ferrugineo-villosis, laciniis limbi interioribus unguiculatis acuminatis, labello bipartito lobis semiovatis staminis dimidium subæquante.

H. flavescens, Lindl. Herb. et in Hort. Soc. Journ. vii. p. 281. Ejusd. et Paxt. Flow. Gard. iii. p. 164. n. 648. f. 311 (haud Carey apud Rosc.).—*H. Roxburghii*, Siebold in Hort. Soc. Journ. l. c. (haud Blume).

Patria?

There is a beautiful specimen of this noble plant in Dr. Lindley's Herbarium, from the Horticultural Society's Garden at Chiswick. Although allied to *H. Gardnerianum*, it seems quite distinct; nor can I refer it to any other species. In the Society's Journal, *H. flavescens* is cited for it without hesitation, although quite different, as I think, in wanting the compact spike, the short stamen, etc. of that species; and from my *H. villosum*, with which it is likewise compared, it differs, among other points, by having the long linear anther usual in the genus. The flower is said to be of a pale yellow colour, with a bright orange-coloured filament, and emitting a spicy fragrance.

14. *H. angustifolium;* foliis approximatis bifariis oblongis, basi rotundatis; spicâ sexfariâ, bracteis ternatim verticillatis 3–4-floris; labello longe unguiculato suborbiculato profunde bilobo obtuso, stamine valde porrecto.

H. angustifolium, Roxb. Hort. Beng. p. 1. Corom. Plant. iii. p. 47 (exclusâ tab. 251). Fl. Ind. i. p. 11 et 82 (nota Wall.); etiam in Herb. Banks. Rœm. et Schult. Mant. p. 15. Add. i. p. 71. Spreng. Syst. i. p. 9. Cur. Post. p. 6. Dietr. Sp. i. p. 36. Dietr. Syn. i. p. 10.

the correct name of *Gardnera* is given (instead of *Gardneria*). Endlicher has even established a Suborder of *Gardnereæ*, and in fact I long before him suggested that name for the entire natural order to which the genus belongs.

Wall. Cat. Herb. n. 6547. Bot. Reg. ii. n. 157 (excl. syn. *H. coccinei*). Bot. Mag. xlvi. n. 2078 (excl. eod. syn.).—*H. aurantiacum*, Rosc. Mon. Pl. n. 61. Spr. Cur. Post. p. 6. Dietr. Sp. p. 37. Dietr. Syn. p. 10.—*H. coccineum*, Bot. Cab. viii. n. 705. *H. species*, Griff. Op. Posth. ii. p. 24. n. 371? Ibid. p. 35. n. 569? *H. squarrosum*, Hamilt. in Herb. Banks.

Patria. Montes Kasiani, *Griffith et Wall. Hook. fil.* et *Thoms.* (*Ic. pict. duæ Hook.*).—Goalpara, *Hamilton.*—Upper Assam, *Mack* et *Griffith in Hb. Hook.*—Sikkim, infer. et tractus terrayanus huic adjac. *Hook. fil.* (*Ic. pict.*)—*Chittagong. Ceylona*? Walker in Herb. Hook.

The species, as far as I know, is confined to the eastern part of Hindustan; I never saw it in Nipal, nor had it from the westward. The leaves are rigidly bifarious, not glaucous; their base obtuse and rounded, and the sides bent down. The spike is sexfarious, owing to the flowers, disposed in whorls of threes, regularly alternating with each other; which is peculiarly conspicuous before their expansion. With exception of the colour, Roscoe's figure of *H. aurantiacum*, which I have quoted, is a perfect representation of our species. I quite agree in the remark of that author (under his *H. angustifolium*, which, however, I have expressly omitted quoting), that the figure in Roxburgh's Coromandel Plants belongs to *H. coccineum*, while the description is that of *H. angustifolium*, it being Roxburgh's own species. I had long before come to the same conclusion in regard to his original drawing, preserved at the Calcutta Garden. No botanical author was ever more conscientiously accurate or trustworthy than Roxburgh; but in this instance an error seems to have crept in, which I attribute to his painter having drawn a plant, raised from seeds or rhizomas sent down by Dr. Hamilton from Nipal, where *H. angustifolium* does not grow, but instead of it, the nearly allied if not identical *H. coccineum*.

15. *H. coccineum;* foliis ensiformibus basi acutiusculis spicaque glaucis, nunc pube parcâ subtus conspersis, bracteis 3–6-floris, laciniis limbi interioris cultriformibus, labello ovato bilobo acutiusculo ungue brevi, stamine porrecto.

H. coccineum, Hamilt. in Cycl. Rees. xvii. in loco, n. 5. Icon. pict. in Mus. Proc. Brit. Ind. Or. Royle, Nat. Hist. Himal. p. 357. Rœm. et Sch. Mant. p. 14. Spreng. Syst. i. p. 9. Dietr. Sp. i. p. 36. Dietr. Syn. i. p. 10. Wall. apud Roxb. in Fl. Ind. i. p. 82 (in nota). Ic. pict. in Mus. cit. Cat. Herb. n. 6548. Bot. Reg.

xiv. n. 1209. Rosc. Mon. Pl. n. 58 (exclus. syn. *H. angustifolii*, Roxb. Corom. quod ad descriptionem).—*H. longifolium*, Rosc. l. c. n. 59. Spreng. Cur. Post. p. 6. Dietr. Sp. p. 36. Dietr. Syn. p. 10. —*H. angustifolium*, Roxb. Corom. Pl. iii. tab. 251 (exclus. descr.). Rosc. l. c. n. 60 (reversâ citat. Roxb., excludenda nempe descr. non ic.). —*H. coccinei var.*, Hamilt. l. c.—*H. carneum*, Rosc. l. c. n. 57 (non Careyi). Bot. Cab. vii. n. 693.

β. floribus carneis nunc fere albis, labello plicato subinfundibuliformi, staturâ proceriore).—*H. elatum*, Brown in Bot. Reg. vii. n. 526. Bot. Cab. ix. n. 856. Rosc. l. c. n. 63. Spr. Syst. p. 9. Cur. Post. p. 7. Dietr. Sp. p. 35. Dietr. Syn. p. 10. Wall. Cat. n. 6549.—*H. carneum*, Bot. Mag. liii. n. 2637. Rosc. in Herb. Hook. ex Horto Liverpooliano (non Mon. Plants). Wall. Ic. pict. in Mus. Proc. Ind. Or. Spreng. Cur. Post. p. 6.—*H. stenopetalum*, Bot. Cab. xx. n. 1902.—*H. barbatum*, Wall. Cat. n. 6548? (specim. deflorat.)

Patria. Napalia. Kamaon, ad elev. ped. 5000, *Strachey et Winterbottom in Herb. Hook.*—Sikkim, *Hook. fil. Icon. pict. Cathcartii.*—β. Napalia et Kamaon. Mons Taong-Dong prope Avam?

I believe it to be impossible to discriminate between Hamilton's *H. coccineum* and Roxburgh's *H. angustifolium*, except in their fresh state; and after all, they may possibly be one and the same species. The former is a taller glaucous plant, with leaves generally tapering from their pointed base into an acuminate apex; they are less rigidly bifarious and the spike less sexfarious than in the latter.—*H. elatum*, *carneum*, and *stenopetalum*, are only varieties of *H. coccineum*, and I have accordingly united them under β. Roscoe's and Loddiges' *H. carneum* seems rather to come under the normal form.

16. *H. Hasseltii;* foliis lanceolatis acuminatis glabris, spicâ elongatâ patente laxe imbricatâ, spathis obtusis sericeis, fasciculis solitariis 2–3-floris, tubo corollæ limbo triplo longiore, laciniis subæqualibus lineari-lanceolatis, labelli 2-partiti segmentis falcato-lanceolatis obtuse acuminatis (*Blume*).

H. Hasseltii, Blume, Enum. Plant. Javæ, i. p. 56. Dietr. Syn. i. p. 10.

Patria. Javæ sylvæ occidental., supra arbores. Mons Prahu Javæ *Herb. Horsf. in Museo Banksiano.*

Dr. Horsfield's specimens in the Banksian Herbarium seem to be either this or the next following species (*H. intermedium*, Blume).

The Javanese name of the plant is *Simpol*, and the flowers are white, according to Dr. Horsfield.

17. *H. intermedium;* foliis lineari-lanceolatis ad costam subtus pubescentibus, spicâ elongatâ laxâ fasciculis solitariis–ternis subtrifloris, limbi laciniis tubo dimidio brevioribus, exterioribus anguste linearibus, interioribus lineari-lanceolatis labello longitudine æqualibus; labelli bipartiti segmentis falcato-lanceolatis obtusiusculis (*Blume*).

H. intermedium, Blume, l. c. p. 57. Dietr. l. c. p. 10.

Patria. Montosa Java occidentalis. "Hinc *H. villoso* inde *elato* accidit," Blume l. c.

18. *H. simile;* foliis lanceolatis acuminatis glabris, spicâ brevi erectâ laxe imbricatâ, spathis acutis margine inflexis sericeis, fasciculis solitariis 1–2-floris, tubo corollæ limbo triplo longiore, laciniis interioribus externis multo latioribus lanceolatis, labelli 2-partiti segmentis falcato-lanceolatis acuminatissimis (*Blume*).

H. simile, Blume, l. c. p. 57. Dietr. l. c. p. 10.

Patria. Mons Salak supra arbores. "Affine *H. Hasseltii* et *gracili*, Roxb." Blume, l. c.

19. *H. Roxburghii;* foliis lanceolatis acuminatis subtus villosis, spicâ elongatâ patente laxe bifariam imbricatâ, spathis acutis villosis, fasciculis remotis subbifloris, limbo tubo dimidio breviore, laciniis lineari-lanceolatis, interioribus longioribus basi angustatis, labelli bifidi laciniis obtusis.

H. Roxburghii, Blume, l. c. p. 57. Hasskarl, Cat. alt. Hort. Bogor. p. 51.

β. spicis densioribus fasciculis approximatis, inferioribus 4-floris.—*Blume, l. c. Hassk. l. c.*

Patria. Sylvæ primævæ montis Gede Javæ.—*β.* Sylvæ humiliores ejusdem montis ignivomi.

"Distincta species ab *H. villoso*, foliorum villositate, laciniis corollæ longitudine haud æqualibus labellum superantibus," Blume, l. c. "An *H. glaucum*, Rosc.?" Hassk. l. c.

I presume that had there been anything extraordinary about the anthera (as is the case in my *H. villosum*), so accurate and minute an observer as Blume would undoubtedly have noticed it, whereas he is entirely silent on the subject.

20. *H. lingulatum;* foliis elliptico-ovatis vel lanceolatis subtus glaucescentibus pubescentibus, ligulis longissimis: spicâ vix exsertâ, bracteis

obtusiusculis 3–4-floris; calyce tubi dimidium vix æquante; laciniis externis linearibus, interioribus spathulato-oblongis; labello subrotundo unguiculato filamentum æquante. (Character ad descr. cit. Hassk. concinnat.)

H. lingulatum, Hasskarl, Cat. alt. Horti Bogor. p. 51. Plant. Javan. Rarior. p. 135.

Patria. Java.

"Inter *H. glaucum* et *thyrsiforme* collocanda species, quæ ulterior diversa foliis undulatis filiformi-acuminatis bracteis subreflexis 2–3-floris, labio filamento breviore, laciniis limbi linearibus, vaginis haud viridibus, ligulâ brevi." Hassk. loc. posteriore.

The outer limb, according to M. Hasskarl, is yellowish, the inner white, base of the lip saffron-coloured.

21. *H. Spanogheanum*, Wall.; foliis oblongis attenuato-acuminatis glabris, bracteis approximatis elongatis acutis convolutis calyce tuboque longissimo dense obsitis villis sericeis adpressis, laciniis exterioribus angustissimis longissimis, interioribus lanceolatis, stamine labellum bipartitum? superante, antheræ loculis basi altius solutis.

Patria. Java, *Spanoghe in Herb. Hook.*

This densely villous and silky-spiked species I think is different from all the preceding five Javanese ones. I am uncertain about the labellum, as the specimen in Sir W. Hooker's herbarium has only a few flowers, which I am unwilling to disturb. The almost capillary end of one of the outer laciniæ extends beyond the apex of the advanced flower-bud. The tube is villous, and nearly five inches long.

C. *Siphonium.* Limbi interioris lacinia postica subcucullata mucronata. Anthera leviter cristata. Calyx persistens immutatus.

22. *H.* (Siphonium) *scaposum;* subacaule, glabrum, radice tuberosâ, foliis fere omnibus radicalibus lanceolatis acuminatis petiolos vaginæformes ligulâ destitutos longitudine æquantibus, spicâ bracteis subimbricantibus attenuatis, tubo longissimo, labello ovato bifido subsessili.

H. scaposum, Nimmo, Grah. Bombay Catal. p. 205.—*Monolophus scaposus*, Dalzell in Hook. Journ. ii. p. 143. Wight Ic. vi. p. 20. t. 2030. Walp. Annal. iii. p. 605.

Patria. Concan australis paludos. planitierum Karle et sylv. Lawanowlee, copiose, *Grah. l. c.* Ripæ rivulor. prov. Malwæ, *Dalz. l. c.* Malabar, *Wight, l. c.*—Jugum (vel Angustiæ) penins. Ind. Or. vulgo

Ghats dictum, *Dalz. in Herb. Hook.* Palud. a Karle ad Kandolam, *Jacquemont in Herb. Hook. fil. e Museo Parisiano.*

With exception of the somewhat crested anther and the tuberous root, this very remarkable plant has no striking affinity in character or habit to *Monolophus*, or *Kæmpferia* either, and it wants altogether the delicate texture of their flowers. To *Hedychium* it comes much nearer. Following the example first set by Mr. Brown in his Prodromus, and also applied by him to the next following species, I enter our plant for the present as a subgenus, differing on the points I have noticed above. The persistent calyx crowns the capsule in the form of a curved tube, having its mouth cleft on one side, and three-toothed on the other, according to Dr. Wight's instructive and detailed plate. Both the bracts and calyx seem to me to be of a more firm substance than is usual in our genus, and the corolla, too, participates in some degree of that character. The tube is very long, the limb comparatively short, the inner much broader. Filament very short. The sheath-like petioles seem to point at their being imbricate in the early stage of the plant, and as there are a few (subsessile ones) on the stem, according to Dr. Wight, the latter cannot properly be called a scapus. In M. Jacquemont's specimen all the leaves are radical. There is no ligula. Mr. Dalzell says that the plant is handsome, with white scentless flowers. The leaves, and still more the flowers, are marked with many minute glandular round dots.

D. *Brachychilum*, Brown, MSS. Labellum nanum retusum sessile. Stigma bilabiatum, labio inferiore triplo longiore.

23. *H.* (Brachychilum) *Horsfieldii*, Brown, MS.; glabrum, foliis lanceolatis acuminatis, spicâ laxiusculâ, bracteis ovatis 2-3-floris, tubo gracili, limbi interioris laciniis lateralibus ovalibus obtusiusculis, exteriores lanceolatas acutas latitudine triplo excedentibus.

Patria. Mons Prahu Javæ, *Horsfield in Herb. Banks.*

I am indebted to my illustrious friend Mr. Brown, for the following details of the inflorescence of this most singular plant, which I have copied from the original manuscript, lent to me on purpose, and which was written in 1815, when Dr. Horsfield sent the specimen from Java to the late Sir Joseph Banks.

Planta elegans glabra, rhizomatosa, juxta specimen unicum in herbario citato circiter bipedalis. *Folia* punctis lineolisque longitudinalibus creberrimis notata. *Ligulæ* perquam tenues, rotundato-obtusæ. *Calyx*

glanduloso-punctatus, tubo tertiâ parte brevior ore hinc fisso inde acervulo pubescentiæ. "*Limbi exterioris laciniæ* angusto-lanceolatæ, concaviusculæ, acutæ, tubo breviores, post expansionem reflexæ; tertia acumine brevi subulato; *interioris laciniæ laterales* ovales, obtusiusculæ, longitudine limbi exterioris, ejusdem laciniis duplo et ultra latiores, punctis minutis glandulosis creberrimis instructæ, immerse venosæ. *Labellum* minutum, vix octavam partem longitudinis lateralium emetiens, latius quam longum, retusum, punctatum. *Filamentum* intra laciniam acuminatam limbi exterioris insertum, cum basi labelli oppositi quasi continuum, breve, lineare, concaviusculum. *Anthera* lato-linearis, apice nuda, basi semibifida. *Stigma* bilabiatum hispidum, labiis ciliatis, inferiore triplo longiore subovato."

The delicacy of the flower is that of a *Monolophus*, but in all other respects our plant has the appearance of a *Hedychium*, with this striking difference, that the labellum is exceedingly small, so as to be hidden almost from sight, and consists of a very short broad concave retuse body.

I subjoin the generic character of *Hedychium*, amended according to the preceding 23 species; although I think the genus ought to be still further enlarged, so as to comprise *Kæmpferia* and *Monolophus*, and bear the name of the former of these.

Calyx tubulosus, tridentatus, deciduus (excepto *H. scaposo*). *Corollæ tubus* elongatus, gracilis; *limbi laciniæ exteriores* angustæ; *interiores* difformes; *labellum* majus (præter *H. Horsfieldii*) bifidum, raro indivisum. *Filamentum* filiforme, nunc planiusculum. *Anthera* terminalis linearis (minuta in *H. villoso*), loculis basi solutis, connectivo apice nudo (in *H. scaposo* cristâ brevi terminato). *Stylus* filiformis; *stigma* infundibuliforme (præter *H. Horsfieldii*, cui inæqualiter bilobum). *Ovarium* inferum, 3-loculare; *ovula* plurima, angulo centrali loculi adfixa, horizontalia. *Capsula* 3-locularis, nuda (salvo *H. scaposo*, cui calyce immutato coronata), loculicido 3-valvis. *Semina* plurima, arillata. —Herbæ asiaticæ caulescentes, erectæ; radice rhizomatosâ horizontali (tuberosâ in *H. scaposo*); foliis in vaginis semiamplexicaulibus petiolatis vel subsessilibus; inflorescentiâ terminali spicatâ, spathis (bracteis exterioribus) arcte imbricantibus vel patulis, floribus solitariis vel fasciculatis bracteis propriis involutis.

On Tetracrypta *and* Kokoona, *Genera of Ceylon Plants; by* G. H. K. Thwaites, Esq., *Superintendent of the Royal Botanic Gardens, Peradenia, Ceylon.*

(With two Plates, Tab. V., VI.)

I. Tetracrypta, *Gard. et Champ.* Nat. Ord. Hamamelideæ? (*Anisophyllea*, Br.; *Anisophyllum*, Don.)

Tetracrypta *cinnamomoides*, Gard. et Champ. *in Hook. Journ. Bot. et Kew Garden Misc. v.* 1. *p.* 314*. Anisophyllum Zeylanicum, *Benth. in Niger Flora, p.* 342, *et Appendix, p.* 575. Tab. V.

Hab. Mountains of the Central and Western Provinces of Ceylon; alt. 3000 ped. Herb. Hort. Bot. Reg. Perad. n. 2205. Nom. vern. "*Wellepeyenna.*"

Arbor ramosa 40–50-pedalis, cortice lævi. *Rami* inferiores horizontales, superiores suberecti; ramulis appresse puberulis. *Folia* disticha, coriacea, breve petiolata, lanceolata, cordato-acuminata, basi angustata, 5-nervia, utrinque glaberrima; juniora rubra; paria vernatione opposita dissimilia squamæformia, unico 5-nervi marginibus involutis demum explanato foliaceo, altero 1-nervi plano stipulam referente cito deciduo. *Racemi* supra-axillares, solitarii v. gemini, strigoso-puberuli. *Flores* parvi, subsessiles, bracteati. *Bracteæ* minutæ. *Calycis limbus* superus, 4-fidus, lobis acutis, valvulis persistentibus. *Petala* minuta, carnosula, laciniata, æstivatione induplica-

* A very good description of this curious plant will be found in the first volume of this Journal; but Mr. Thwaites's being fuller, and explaining the remarkable vernation, we have had no hesitation in giving it here. The Natural Order of *Tetracrypta* appears to us doubtful; but the relationship with *Hamamelideæ* is, as suggested by Dr. Gardner, very strong, and until the structure of the seed shall be known it may be referred provisionally to that Order. The generic name has occasioned a great deal of confusion. Brown first proposed the genus, for a West African species that yields a large edible fruit (in Hort. Soc. Trans. vol. v. p. 446), under the name of *Anisophyllea*, but gave no description. Don, in his West African collections, applied the name *Anisophyllum*, Don, MSS., to the same plant. Mr. Bentham, in the Niger Flora, took up Don's name for the West African plant, referred it doubtfully to *Rhizophoreæ*, and added in a note a description of the Ceylon species drawn up from Mr. Walker's specimens. In the same year, or perhaps the previous year, Gardner and Champion published *Tetracrypta* in the 'Madras Journal of Science' we believe, and subsequently in the Kew Garden Miscellany, and referred it to *Hamamelideæ*. In the supplement to the Niger Flora Mr. Bentham points this out, and states that the name *Anisophyllea* of Brown has the priority. Under these circumstances we have thought it desirable to retain the name *Tetracrypta*, both because it was accompanied with the first published account of the genus, and because it was the only one to which Mr. Thwaites appears to have had access.

tiva, segmentis 5 linearibus subulatis. *Stamina* 8, alterna breviora, filamentis subulatis calyce insertis; antheris versatilibus longitudinaliter dehiscentibus. *Styli* 4, erecti, conico-subulati; stigmatibus capitatis. *Ovarium* 4-loculare; loculis 1-ovulatis; ovulis pendulis anatropis. *Fructus* indehiscens, abortu 1-spermus. *Semen* pendulum, albuminosum?

This is a handsome tree, 40 feet and upwards in height: its *wood* is very hard and valued by the Cinghalese for building purposes. *Young stems* and *leaves* downy, of a bright-red colour. The dissimilarity in the pairs of young leaves is very remarkable, one being flat, single-nerved, and soon falling away, whilst the other is five-nerved, has involute margins, grows rapidly, and is carried up by the elongating stem to some distance above the smaller one. *Old leaves* coriaceous, distichous, alternate, shortly petioled, 3–4 inches long, 1 inch broad, lanceolate, tapering to a long narrow blunt point: nerves five, strong, parallel. *Racemes* single or in pairs from the upper part of a large scar, which extends upwards from the axil of the leaf, pendulous or nodding, 1–1½ inch long, pubescent, eight- to twelve-flowered. *Flowers* nearly sessile, with small bracts, white, 1 line long, pubescent. *Calyx* of four valvate coriaceous green lobes. *Corolla* of as many small incurved white petals, seated on the calyx, split below the middle into subulate laciniæ. *Stamens* eight, alternately longer and short; filaments subulate; anthers versatile; pollen minute, elliptical, with a dark central line. *Ovary* inferior, four-celled, with four erect styles and small capitate stigmas; cells with one anatropous ovule, pendulous from the summit of each. *Fruit* coriaceous, grooved, elliptical-ovate, with a narrow top and persistent calyx, one-celled, with one pendulous seed, which has only been collected unripe, but appears to be albuminous and to have an axile embryo.

Plate V. Fig. 1, 2. Very young leaves and stipules in vernation. 3. Flower. 4. Vertical section of the same. 5. Petal. 6. Stamens. 7. Transverse section of ovary. 8. Branch and nearly ripe fruit. 9. Vertical section of immature fruit. 10. Ditto of nearly ripe fruit:—*all but fig.* 8 *and* 10 *magnified.*

II. Kokoona, *Thw.*, gen. nov. Nat. Ord. Hippocrateaceæ.

Gen. Char. *Calyx* brevis, persistens, margine 5-lobo. *Petala* 5, æstivatione contorta, firma, concava, glanduloso-punctata, decidua. *Sta-*

mina 5, petalis alterna; filamentis basi disco glanduloso immersis; antheris oblongis, introrsis, longitudinaliter dehiscentibus. *Ovarium* disco immersum, 3-loculare, loculis 4-ovulatis; ovulis biserialibus, adscendentibus, anatropis. *Stylo* brevi, conico; stigmate capitato, 3-lobo. *Capsula* 3-locularis, loculis 4-spermis. *Semina* late alata, exalbuminosa, erecta; embryone orthotropo, cotyledonibus planis, radicula infera.—Arbor *ingens, ramosa, cortice rugoso.* Folia *opposita, petiolata, obovata vel retusa, versus petiolum angustata, obscure remote crenulata, lævia, coriacea, subtus minute glanduloso-punctata, stipulata.* Stipulæ *minutæ, coloratæ, acutæ, subpersistentes.* Inflorescentia *paniculata, axillaris.* Bracteæ *minutæ.* Flores *pedicellati, læves.*

Kokoona *Zeylanica*, Thw. TAB. VI.

HAB. Central provinces of Ceylon, Ambagamowa district; elev. 4000 feet. Herb. Hort. Reg. Bot. Peradeniensis, No. 2584.

A large forest-tree, 60 feet or upwards in height, much branched, especially towards the top. *Bark* rough, when cut of a yellow colour, somewhat corky. *Leaves* dark green, smooth, underneath paler, with very numerous minute dark red glandular dots. *Stipules* very minute, deep red, subpersistent. *Panicles* axillary, raceme-like. *Bracts* very minute, acute. *Flowers* dull yellowish-brown. *Calyx* minute, with five shallow lobes, persistent. *Petals* five, concave, firm in texture, with minute pale glandular dots on the inner surface, twisted in æstivation. *Stamens* five, alternate with the petals, inserted into depressions of the dark green angular disc. *Ovary* three-celled, each cell with four ascending anatropal ovules. *Style* short. *Stigma* capitate, somewhat three-lobed. *Capsule* 1–4 inches long, oblong, bluntly triangular, three-valved, three-celled. *Seeds* imbricated, winged, erect, exalbuminous. *Wing* very broad, oblong, truncate or blunt. *Embryo* orthotropal; cotyledons flat.

In habit and general appearance this plant resembles the *Celastraceæ*, though it would seem to differ almost as much from members of that natural family as do the *Hippocrateaceæ*, from all the genera of which latter Order it differs in having five stamens.

The yellow bark is sold in the bazaars, and when pounded is used by the Cinghalese as a kind of cephalic snuff, being mixed with ghee and introduced into the nostrils in order to relieve severe headache, by encouraging a copious secretion from the nose.

The native name of the tree is *Kokoon*, which has suggested the generic name.

PLATE VI. Fig. 1. Flower. 2. Stamen. 3. Ovary and disc cut longitudinally. 4. Transverse section of the same. 5. Small, immature capsule. 6. Transverse section of the same. 7, 8. Seeds. 9. Branch and stipules:—*all but fig.* 5 *and* 6 *magnified.*

KEW GARDEN MUSEUM; *or, a Notice of the Origin and some of the Contents of the* MUSEUM OF ECONOMIC BOTANY *attached to the* ROYAL GARDENS OF KEW; *by* the Director, SIR W. J. HOOKER, K.H., F.R.A. and L.S.

(*Continued from p.* 337.)

Ord. MAGNOLIACEÆ. MAGNOLIA FAMILY.

The well-known *Magnolias* are the type of this Natural Family, which, however conspicuous by luxuriant foliage, large and beautiful and highly fragrant flowers, does not yield much to economic botany. The bark, indeed, is considered tonic and aromatic, and the fruits also; while the too powerful odour of the flowers often occasions nausea, headache, and faintings.

Swamp-sassafras, or *Beaver-tree*. Magnolia glauca, *L.* Fruit. Both the fruit and the bark in the United States, where it is a native (and called *Swamp-sassafras*, or *Beaver-tree*), are in high esteem for their bitter and aromatic principle, rivalling Cinchona, it is said, in the qualities.

Talauma fragrantissima, Gardn., from Brazil, and *Talauma Candollei*, Bl. Fruits. Remarkable only for their form and structure.

Tulip-tree. Liriodendron tulipifera, *L.* Bark. Bitter and aromatic. Employed medicinally in North America, where the tree is one of the most stately of the forests.

Champaca. Michelia Champaca, *L.* Flowers, in spirits. (Hort. Soc.) Native of China. All the parts of this tree are highly stimulant.

Winter's Bark. Drimys Winteri, *De Cand.* Wood and bark (D. Hanbury, Esq.). Stimulant, aromatic, and tonic, properties analogous to those of Cinnamon and *Canella alba*, with which latter it has been by many writers confounded. The tree was discovered in the Straits of Magellan by William Winter, captain of one of the ships which ac-

companied Sir Francis Drake, during his celebrated circumnavigation, in the year 1578. Returning in 1579, he brought home some of the bark, which Clusius named after him *Winteranus cortex*.

Drimys Granatensis, L. fil. Bark. Venezuela and New Granada (Mr. Waagner). In Brazil called *Casca d'Anta*. Apparently only a variety of *Winter's bark*, extending into the tropics of South America, and possessing the same properties.

Star-Anise. Illicium anisatum, *L.* Fruit. Japan and Cochin-China. *Anisum stellatum* of the shops. Aromatic and carminative. The oil is often substituted for that of common Anise. Used in the fabrication of liqueurs.

Ord. ANONACEÆ. CUSTARD-APPLE FAMILY.

Mostly tropical trees and shrubs. The fruits of many are esculent, and much prized; properties aromatic. The *Lancewood* is said to be the *Duguetia Quitarensis* of Schomburgk.

Soursop, or *Rough Custard-apple*. Anona muricata, *L.* Fruit. West Indies and South America (Mr. N. Wilson). The fruit, as large as a Shaddock, is readily known from the other kinds of Custard-apple by being muricated with soft prickles. It is much eaten, often mixed with sugar, and wine and nutmeg, and possesses a grateful acid. Cultivated in Western Africa, whence a necklace, formed of the seeds of this fruit, has been brought to the Museum by Dr. W. Mackenzie Skues.

Sweetsop, or *Scaly-fruited Custard-Apple*. Anona squamosa, *L.* Native, it would appear, of the Malay Islands, but abundantly cultivated in the East and West Indies (Hort. Soc. and Dr. Rattan). A good figure of it is given in the 'Botanical Magazine,' tab. 3095. Fruit warted, as it were, with large, convex, adnate scales. It has a sweet flavour, and is much esteemed at table by some, spoken lightly of by others. The Creoles are exceedingly fond of it, but Dr. M'Fadyen says he never knew a European who was partial to it.—(We do not possess the *Cherimoya* or *Cherimolia* of Peru, Anona Cherimolia, *Lam.*, A. tripetala of *Aiton*. It seems to be cultivated only in Peru, and, judging from the figure of Feuillée, Per. vol. iii. p. 17, it must be very nearly allied to *A. squamosa*. The fruit is, like it, scaly, and, as just observed of that species, is excessively prized by the Creoles, and vaunted as the most delicious in the world; Father Feuillée remarks, and probably other Europeans would agree with him, "il est certain qu'une de

nos Poires ou de nos Prunes valent mieux que toutes les Cherimollos du Pérou.")

Common, or *Netted Custard-apple, Bullock's heart.* Anona reticulata, *L.* (See figure in the 'Botanical Magazine,' tab. 2911 and 2912.) Fruit. Said to be a native of the West Indian Islands, and thence introduced into the East Indies and the Malay Archipelago; cultivated abundantly in tropical regions, generally for the sake of its fruit, which is neither muricated nor scaly, but reticulated, and of which Sir Hans Sloane says, "It is for colour and consistence and sweetness in taste, like a custard, whence the English name; it is eaten with a spoon, and thought a very delicious substance; yet by others it is but little prized." M'Fadyen says it would be a very excellent fruit, were it not that it is rather too luscious.

Negro-pepper, or *Guinea-pepper.* Habzelia Æthiopica, *Alph. De Cand.* (*Unona,* De Cand.) The small torulose fruit, when dry, is aromatic and pungent, and is the *Piper Æthiopicum* of commerce; used as pepper by the natives of the African coast, where the plant is a native. It is also cultivated in Brazil (Mr. Wetherall). On the Gold Coast it is called *Eiru* (Sir John Richardson).

Other little-known fruits of *Anonaceæ* are in the collection, but nothing is ascertained of their properties and uses.—Gærtner and others refer to this Natural Order a plant that is supposed by Mr. R. Brown to be a native of Western Africa, but only botanically known to us through Gærtner, and a drawing by the late Dr. Bancroft, published in the 'Botanical Magazine,' tab. 3059: it is the *American Nutmeg* of Long's 'History of Jamaica,' *Monodora Myristica* of Dunal and De Candolle. The only tree with which Dr. M'Fadyen was acquainted was in "Miss Green's garden in Liguanea, Jamaica, near Constant Spring Estate." The fruit is a large subglobose berry, containing numerous seeds "so impregnated with aromatic oil, resembling that of the East Nutmeg, as to admit of being employed for similar purposes in food or medicine: the only perceptible difference is that they are less pungent." This information is the more interesting, because recent investigations have shown that there is a great natural affinity between the Nutmeg family and that of the Custard-apple.—We should be thankful to any resident in Jamaica or in Western Africa, who would procure specimens and information, and communicate them to us.

Ord. MENISPERMACEÆ. MOON-SEED FAMILY.

This Natural Family derives its name from the lunate form of the seed and especially of the embryo, and consists chiefly of tough climbing shrubs, the wood often without zones or concentric layers. They possess powerfully bitter and narcotic qualities, and are nearly all tropical, and chiefly Asiatic, plants.

Calumba or *Kalumb root.* Jateorrhiza palmata, *Miers.* (Cocculus, *De Cand.*) "One of the most useful stomachics and tonics." Native of Mozambique and the adjacent Eastern coasts. The large thick roots are dug up by the natives, and the offsets are cut in slices, strung on cords, and hung up to dry in the shade. (See figure and description in the 'Botanical Magazine,' tab. 2970 and 2971.)

Cocculus Indicus. Anamirta Cocculus, *Colebr.* (Menispermum Cocculus, *L.*) Native of Malabar and the Malay Islands. Seeds. A highly poisonous drug, extensively employed for intoxicating fish, and by unprincipled brewers in the manufacture of beer. The greater part of the large quantity imported is indeed used for illegal purposes.

Pareira brava, or *Velvet-leaf.* Cissampelos Pareira, *L.* Root (D. Hanbury, Esq.). Native of the West Indian Islands and South America. Possesses a tonic power, and occasionally acts as a diuretic.

Cissampelos Capensis, Th. Root. Cape of Good Hope. (Great Exhibition; part of a collection of Cape drugs.)

False Calumba root (or rather *stem*). Coscinium fenestratum, *Colebr.* (Menispermum, *Gærtn.*) Ceylon (D. Hanbury, Esq. and G. H. K. Thwaites, Esq.). A root of some interest, on account of the frauds that have been practised with it, large quantities having been sent to this country from Ceylon, which have found ready purchasers, as *true Calumba-root;* whereas though it is, as Mr. Thwaites tells us, "employed in Ceylon mixed with other things, in a great many complaints, and applied externally in some cases, its healing virtues are very problematical." In the volume of the 'Pharmaceutical Journal' for 1852 will be found a history of this fraud upon the public by Daniel Hanbury, Esq. The internal organization of this stem is very curious.

Ord. BERBERIDEÆ. BERBERRY FAMILY.

Acidity of fruit, owing to the presence of malic acid, and yellow dye afforded by the wood and root, exist probably in all the species of Berberry. The fruit of *Berberis aristata* is said by Dr. Royle to be

dried by the Hill-men (Himalaya) in India, as Raisins are prepared. The curious irritable nature of the stamens is known to most observers of nature.

Common Berberry. Berberis vulgaris, *L.* Europe. Wood and bark and root (very yellow in colour in the natural state). Yield a yellow dye, and, according to Dr. Ure, the solution of the root is employed in the manufacture of Morocco-leather. The pretty orange-red oblong berries make an excellent preserve.

Berberis tinctoria, Lesch. Wood and fruit. Neilgherries. Led by analogy, no doubt, M. Leschenault had the wood of this Neilgherry Berberry analysed by M. Vauquelin, and it was ascertained to contain the yellow colouring principle in a greater state of purity than our own Berberry; and it is, according to Dr. Royle, inferior to few woods for dyeing a yellow colour. Subsequent investigations have shown that this species is referable to the *B. aristata,* De Cand. of Nepal, etc., very nearly indeed allied to our *B. vulgaris:* a warmer and drier climate may be considered to have improved the dyeing principles.

Ord. Sarraceniaceæ. Sidesaddle-flower Family.

Though no peculiar properties are known to exist in this Family, the remarkable structure of its foliage cannot fail to strike attention. It is peculiar to the New World, and was long supposed to be limited to one genus, *Sarracenia,* of which the species are confined to North America and extend from Canada to Florida, growing in swampy places. The curious genus *Darlingtonia, D. Californica* of Dr. Torrey, has recently been discovered at the head-waters of the Sacramento, Northern California, while *Heliamphora nutans,* Benth., inhabits British Guiana. The leaves of all are remarkable for their tubular character, the main portion forming a long tube, dilated upwards, while a kind of hood covers the mouth in a greater or less degree. These tubes contain water, which attracts vast numbers of insects, that enter and perish; so that the leaves are commonly seen to be more or less full of dead insects. Their ingress is aided by a lining of inverted short hairs, which by their very direction discourage the captives' egress. The leaves in the Museum are those of

Red Sidesaddle-flower. Sarracenia rubra, *Walt.*

Purple Sidesaddle-flower. Sarracenia purpurea, *L.*; and

Parrot's beak Sidesaddle-flower. Sarracenia psittacina, *Mich.*

Ord. Nymphæaceæ. Water-Lily Family.

The large rhizomes, or underground stems, of these aquatics, as well as the seeds, if large enough to render them worth the gathering, both of which contain a good deal of starch, are esculent, yet rarely used by man in a civilized state. In some countries the former (commonly called the roots) are turned to good account in feeding swine. But if it be a Family deficient in practical utility to man, it holds the first rank among plants for the size and beauty, and frequently fragrance, of its flowers, and the amplitude of its foliage. These are characters that cannot be exhibited in a Museum, where we have, however, in some cases, the flowers modelled in wax.

Victoria Water-Lily. Victoria regia, *Lindl.* Native of many of the still waters of tropical America, east of the Andes. Flowers and fruit and young leaf and sections of flowers from the Amazon (Mr. Spruce), and from Bolivia (Mr. Bridges); and seeds from Paraguay (Mr. Pentland). Section of root-stock and of young fruit from the cultivated plant in the Garden. Flower and bud and young leaf, beautifully modelled in wax, and presented by Miss Tayspill, may be seen on the table of Room No. 1, apart from the arranged *Nymphæaceæ.* Nothing but the growing plant, in our own stoves or in its native waters, can give an idea of the magnificence of this aquatic. The prickly leaves and flowers both float on the surface of the water: the former are quite orbicular, measuring 6–6½ feet in diameter, with leaf-stalks sometimes 18 feet long, and the flowers 14–16 inches in diameter. Roots and seeds, the latter called *Water Maize* in South America, are collected and eaten by the native Indians.—A series of four large drawings, exhibiting the botanical characters of this plant, are suspended on the wall of the staircase.

Prickly Euryale. Euryale ferox, *Salisb.* East Indies. Seeds, eaten by the Hindoos (Dr. Hooker). The plant may be considered a *Victoria* in miniature, with leaves no larger than the White Water-Lily, and flowers smaller than any of the Family.

Downy Water-Lily. Nymphæa pubescens, *Willd.* East Indies. Root (Dr. Stocks). Much eaten in Scinde by the natives.

White Water-Lily. Nymphæa alba, *L.* Europe. Roots, used in Scotland for dyeing black or grey (Messrs. Lawson). M. Fée says that they have been long employed in France in tanning leather, and that a tolerable sort of beer has been prepared from them.

Blue Water-Lily. Nymphæa cærulea. South Africa, etc. A model of this, also prepared and presented by Miss Tayspill, may be seen on the table of the Room No. 1, of the Museum.

Yellow Water-Lily. Nuphar luteum, *Sm.* Europe. Flowers, in alcohol. The leaves are reported to be styptic (Endlicher). The flowers have certainly a brandy-like smell, and the pistil is shaped like a flask, whence arises the name of the plant in some counties of England, of "Brandy-bottle." According to Withering, the roots, rubbed with milk, destroy crickets and cockroaches; but swine eat them. The same author further adds, that an infusion of a pound of the fresh root to a gallon of water has been known to cure a leprous eruption of the arm.

Spatter-dock. Nuphar advena, *Ait.* Roots. North America. Properties I do not find noticed; they are probably the same as those of the preceding species, to which it is very closely allied.

Ord. Nelumbiaceæ. Water-bean Family.

A Family of aquatic plants, confined to two species, one a native of the tropical and subtropical portions of the Old World, and one of like regions in the New World. That of the *Old World* is of great classical interest, *Nelumbium speciosum,* as considered to be the *Egyptian Bean* (*κυαμος*) of Pythagoras; it was formerly common in Egypt as well as India, but is now, according to Delile and other travellers, extinct in the former country. The seed-vessel, or receptacle of the fruit, is large, in shape an inverted cone, and has the nuts placed loose in apertures or cells on the surface; this has been not inaptly compared to the rose of a watering-pot. The whole, Sir James Smith tells us, "in process of time separates from the stalk, and, laden with ripe oval nuts, it floats down the water. The nuts vegetating, it becomes a cornucopia of young sprouting plants, which at length break loose from their confinement, and take root in the mud." This peculiar mode of propagation has evidently occasioned the plant, in conjunction with the water, to be adopted as the symbol of fertility, in which point of view it has, from the remoted antiquity, been considered with religious veneration in India, and makes a conspicuous figure in the mythology of that ancient country. In the fourth volume of the 'Amœnitates Academicæ,' p. 234, continues Sir James Smith, "a carved horn of a rhinoceros, sent to Linnæus from China, is described. This is now before me, and is an excellent specimen of oriental sculpture, evidently alluding to the

mythology of India. The whole inverted base of the horn is carved into an elegant leaf of *Nelumbo*, rising from the water amid a group of perforated Chinese rocks. It is encompassed with various plants of a more diminutive proportion: a peach-tree and a medlar (or rather perhaps the *Mangosteen*), with *Sagittaria*, *Pothos*, and the *Nelumbo* itself in flower and seed, cover the outer surface. Some fantastic lizards, with bunches of grapes and the *Litchi* fruit in their mouths, are crawling over the whole." This graceful antique it has often been my privilege to see in the library of the late Sir James Edward Smith. It came afterwards, as is well known, with the rest of his collections, into the possession of the Linnean Society of London, and has been engraved by Lady Smith in the memoirs of her late husband.

In ancient Egypt it has been spoken of by Herodotus as "the Lily of the Nile, like a beautiful rose;" by Athenæus as the "Egyptian Bean," or "Rose-coloured Lotus;" and Theophrastus, under the name of "Bean" (κναμος), most accurately describes it, having the "fruit like a wasps' nest, containing about thirty beans, a little projecting, each placed in a separate cell; the flower is twice as large as a poppy, and of a rose-colour," etc., etc.; and it is sculptured on the ornaments and represented in symbolical pictures of the Egyptian temples. It is faithfully depicted in the Mosaics of Palestrina, of which M. Barthélemy has given us the history, where Harpocrates is represented on Egyptian monuments, sitting under the flower and fruit of the "Rose-coloured Lotus," the plant now under consideration: yet so entirely lost is it to the Egyptians, that, as it has been well observed by M. Poiret, the plant thus portrayed would have been unknown to naturalists of the present day, had it not been discovered in India.

Sacred Indian Lotus, or *Bean of Egypt*. Nelumbium speciosum, *Willd.* India. Flowers, in alcohol (East India Company). A group of flowers and foliage admirably modelled in wax, and presented by Mrs. Ewart. Fruit, dry and in alcohol. Root-stock from Scinde (Dr. Stocks), where and elsewhere it is much eaten, boiled and in curries. Seeds, eaten raw or roasted. Necklaces made of the seeds (Major Madden), sold at Benares and considered very sacred.—A drawing of the entire plant is suspended upon the gallery in Room No. 3 of the Museum. We have dwelt the more upon this plant, because of its great beauty, and because it may be seen, in great perfection, during the summer and autumn months in the aquaria of the hothouses.

Yellow Nelumbium, or *Water Chinquepin*. Nelumbium luteum. Flowers, in alcohol, and ripe capsules with seeds (Dr. M'Nab and Mr. James). Tropical America, for example Santa Martha, and Jamaica, and extending as far as the Southern and Western United States, rarely found north of them. We have, we think, clearly ascertained that the tropical *Nelumbium Jamaicense*, etc., of Patrick Brown, is identical with the North American *N. luteum*; and it is not a little remarkable that, save in colour of the flowers and the somewhat more prickly peduncles, this is scarcely to be distinguished from the *Nelumbium* of the Old World, just noticed,—the same foliage, the same form of flowers, the same curious fruits and seeds. The same properties may consequently be expected: "the root-stocks of the *Water Chinquepin*," according to Nuttall, "resemble those of the Sweet Potato, and are, when boiled, as farinaceous and agreeable as the Potato, and are employed as food by the Osage and other Western Indians."

(*To be continued.*)

Jottings on the Mountains; or Notes of a few days' sojourning among the Mountains of CLOVA, etc., *in the Summer of* 1853; *by* Mr. A. CROALL.

(*Continued from p.* 341.)

Next day I returned to Glen Fiadh: the morning was bright and sunny, and the day, though cloudy, was fine; the streams had again resumed the former quiet murmuring, the ground was nearly dry, and I cheerfully ascended the cliffs on the west side of Glen Fiadh, or Craig Rennet, by a stream about half-way up the Glen. On reaching some shelving rock at the base of the cliffs, *Saxifraga nivalis* occurred in considerable plenty, associated with *Draba incana*, and *Didymodon glaucescens* in fruit; turning to the left and proceeding up a dry run, on somewhat isolated rocks, I gathered *Woodsia Ilvensis*, and on rocks on the left immense abundance of *Oxytropis campestris*, both in flower and fruit. In proceeding upwards, *Hypnum rufescens*, *Bryum dealbatum*, and *Encalypta ciliaris* were plentiful. The rocks here have a whitish calcareous appearance, and indeed the "dry run" is very conspicuous, being quite discernible even from the heights above Loch Brandy.

The lower rocks form a long sloping declivity, at the top of which they again became rugged and precipitous, and are somewhat difficult of access. Abundant evidence was still visible of the ruin occasioned by the storm of the previous day in the loose earth, broken fragments of rocks that were scattered around, and in the marks of terrible concussions that had taken place between the projecting rocks and the larger fragments in their descent, the point of contact being surrounded by a stratum of smoke-like dust, where the smell of fire was still apparent. I had penetrated to a considerable distance among the cliffs near the summit, at a place where one of the masses had descended, breaking off pieces of rock and tearing up and grinding the vegetation in its progress. I had just pulled myself up and secured my footing on a green shelf, which had been partly torn from its moorings on the rock: on getting hold of the shelf above and raising myself upon it, my astonishment and delight may be better conceived than expressed, on perceiving the whole shelf covered with a dense mass of *Pyrola rotundifolia*, flowering profusely, and literally loading the air with its delightful fragrance. No one who has not witnessed such a scene can form an idea of the beauty of this lovely alpine gem; and the pleasure was no doubt considerably enhanced by the reflection that on this spot, perhaps, the foot of man had never stood, that no sacrilegious hand had ever culled these floral gems before. After gathering a supply, my attention was attracted by something green on the bare ground beneath a willow close by; on gathering a fragment, what was my delight to recognize the rare and beautiful *Weissia latifolia*, its curious stems and leaves looking like little bulbs at the base of the fruitstalks.

It is curious to see, associated with these alpine rarities, the most common denizens of the plains. Thus *Alchemilla vulgaris*, *Prunella vulgaris*, *Plantago maritima*, *Parnassia palustris*, and numerous others, were growing in close proximity with *Alchemilla alpina*, *Oxytropis campestris*, *Veronica alpina*, *Epilobium alpinum*, *Saussurea alpina*, *Sonchus alpinus*, and many other alpines: *Pteris aquilina* was closely associated with *Aspidium Lonchitis*, and *Hypnum cuspidatum* with *Hypnum rufescens*, and at the head of the Glen, *Polypodium alpestre* grows side by side with *Lastrea dilatata;* but I nowhere observed *Athyrium Filix-fœmina* associated with or at the same elevation with *Polypodium alpestre*, nor did I find a single frond of *Polypodium alpestre* towards the base of the mountains or lower down than the base of the cliffs.

On the boulders in the bottom of the Glen, several species of Lichens are very fine, and on a large boulder near the centre, surmounted by several Birches and Mountain Ash, fine specimens of *Anœctangium ciliatum* occurred, covering a large portion of its northern side. There is perhaps no place so rich in Lichens as the masses of boulders around Loch Brandy and Loch Wharl, where *Gyrophora proboscidea*, *cylindrica*, *erosa*, and *pellita* are all plentiful, the latter however sparingly in fruit, *Cornicularia tristis* and *aculeata*, *Parmelia caperata* and *omphalodes*, and many others. *Gyrophora polyphylla* is also plentiful, but no fruit was observed: and *Andræa rupestris* was very fine. On the sloping summits of the hill above, where the vegetation consisted chiefly of *Trichostomum lanuginosum*, interspersed with tufts of *Cladonia rangiferina*, a very pretty species of *Stereocaulon* growing, not in tufts, but solitary; *Lecidea fusco-lutea* was extremely abundant, richly fruited, and on the bare spots between, occurred the rare and interesting little plant *Pycnothelia papillaria*.

Behind these summits issue a long series of springs, the sources of the streams that, proceeding eastward, combine to form the tributaries of the North Esk. On bare spots above these, was picked abundantly in fruit *Conostomum boreale* and *Dicranum falcatum*, associated with *Polytrichum hercynicum*, also in plenty. On a bare knoll of decomposing whitish feldspar, close beside a small lake a little above these springs, grew the singular Lichen, *Cladonia vermicularis;* this is more plentiful on the summit of Ben Red, where also was gathered a fine tuft of the large form of the *Splachnum mnioides.* All the specimens of this plant that I have met with this season, were growing on animal matter, and, with one exception, on the droppings of birds of prey, possibly that of owls; for in cutting up the tufts, the mass was found to consist almost entirely of hair and fragments of bones, part of the skull, apparently, of a mouse, being repeatedly recognized. On Lochnagar a fine patch of it was seen on a similar substance. *Splachnum mnioides* had at first occupied the site, as the decaying setæ were still evident among the stems of its more immediate successor, *Splachnum angustatum*, the leaves alone remaining to indicate the species. The latter was now fully ripe, and was again in its turn giving place to the previous occupant; this formed a fine green zone around the tuft, and appeared extending itself towards the centre, the plants around the inner margin of the ring being quite young, while those on the outer margin had

a few ripe capsules; most of the plants however were males. The outer margin of the patch was fringed with a fine brown border of *Peltidæa polydactyla*, beautifully contrasting with the rich green of *Splachnum mnioides*, and the central patch of *Splachnum angustatum*, of a pale brown dotted with the reddish capsules.

The spot was on the southern flank of one of "the Paps of Lochnagar," and on the boulders around I observed in great profusion, and richly fruited, the curious *Cornicularia lanata* and *Parmelia Fahlunensis*, also in fruit. On the grassy wettish slopes *Hieracium nigrescens* was very fine, and at the source of a spring *Jungermannia juniperina* with stems from five to six inches in length. On the stream that descends from Lochnagar to Prince Albert's shooting-lodge on Loch Muick, *Polypodium alpestre* occurred, and abundance of *Rubus Chamæmorus* with ripe fruit; this fruit is highly prized by the Highlanders for its flavour, and is sometimes used medicinally. To me the flavour appears more nearly to resemble that of half-rotten gooseberries than anything else, accompanied with a certain greasy odour, and anything but agreeable; yet custom may reconcile one to its defects, and even render it pleasant, especially where the choice is so limited*. The colour certainly is very tempting,—at first a pale green, suffused with red on the side next the sun, at length, when ripe, a pale transparent yellow, the exposed side reddish-orange: the finer specimens are nearly an inch in diameter, and, when contrasted with the bleak, barren flats on which they grow, are very beautiful. The stem is erect, but so slender that the weight of the ripe fruit eventually bends it over till the fruit rests on the ground.

Cornus Suecica is very plentiful on Lochnagar, in the sheltered, grassy hollows, along the streams and around the margin of the loch; in the latter locality still in flower (August 9th).

On the summit of the cliffs, *Cladonia vermicularis* is plentiful on the bare soil; the principal vegetation around consisting of *Juncus trifidus*, which here seems to have a higher range than *Trichostomum lanuginosum*. On the dry slopes the beautiful *Azalea procumbens* was still in bloom. Descending the ravine on the north side, *Saxifraga rivularis* occurred on the damp rocks, along with abundance of the small form of *Polypodium alpestre*, the larger form occurring at the base of the cliffs along

* We have just received a large jar of these Berries (*Moltebaer*, Norse) from a friend in Norway, where they are much prized at the dessert; and, eaten with cream and sugar, we can pronounce them excellent.—Ed.

with a profusion of *Allosorus crispus*, the fronds only just appearing among the *débris*, close beside a large mass of snow. In a wet spot about half-way down, *Bryum Ludwigii* was found, and near the summit the ground was carpeted with *Dicranum* . . .? in fine fruit, still partly covered by a large patch of indurated snow, whose dark mass was now far outvied by the lovely flowers of the *Cerastium alpinum*, which adorned with its rich tresses the frowning rocks around.

On the sloping *débris* between the cliffs and the lake occurred *Phleum alpinum*, *Hieracium alpinum* and *nigrescens*, and among the wet cliffs the viviparous form of *Poa alpina*. In descending towards Deeside, occurred on boulders abundance of *Gyrophora pellita*, so richly fruited that the smallest speck of thallus had its one or two apothecia. Among the heath also occurred large patches of *Jungermannia ciliaris*; in Clova I have only seen it mixed with grass and other mosses. Here *Lycopodium annotinum* also occurred.

The hills on the south side of the Dee are remarkably wild and precipitous. The ravines and sides of the hills are very richly wooded, and would no doubt afford many of the rarer flowering-plants, but we had no time to deviate from the road.

Braemar and Glen Callater were also visited, rather than examined, still a few interesting plants occurred. *Hieracium denticulatum* and *prenanthoides*, and several other forms; *Andræa alpina* was very fine above Loch Callater, also *Carex vaginata*, *Salix arenaria*, *herbacea*, etc.; *Hypnum molle* with abundance of fruit, *Grimmia spiralis*, all the forms of *Polypodium alpestre*, beautiful specimens of *Conostomum boreale*, etc. etc.

On the shores of Loch Muick, a very interesting locality was examined. On the southern shore, nearly opposite the Shooting-lodge, a small stream enters the lake. On boulders in this stream very fine specimens of *Gyrophora erosa* and *proboscidea* were gathered, and on wet rocks some beautiful *Salices*. Near the footpath along the margin of the lake, both to the east and west of the stream, *Linnæa borealis* occurred, also in a small birch-wood nearly opposite the Shooting-lodge, along with *Hypnum Crista-castrensis*, *Sticta pulmonaria* and *scrobiculata*, *Nephroma resupinatum*, *Placodium plumbeum*, *Tetraphis pellucida*, *Dicranum scoparium*, var. *majus*, etc., all in fine fruit. The alluvial delta at the mouth of the stream is a beautiful spot, covered with birches and boulders, the latter completely clothed with *Vaccinium Myrtillus* and *Vitis-Idæa*, both laden with fruit, the former quite ripe, the

latter nearly so, in very large bunches, and very beautiful, exceedingly so, from their peculiar place and manner of growth. The former were the largest and finest I had ever seen. On descending the Capel above Bradooney, *Tofieldia* was found along the streams down almost to the base of the hills.

Economizing of time in these mountain excursions is always a very important object of consideration, where distances are so deceiving, and travelling so fatiguing. The distance to lodgings being always considerable, much time is also unavoidably spent in travelling to and from the inns. To avoid this, several nights during the above ramble were spent in the hill, "among the bonny blooming heather," by which a saving of fully one-half the time was effected. Bivouacking by the side of some huge boulder, we had no difficulty in starting at four o'clock, when, after breakfast, and any little preparation necessary, we started to work immediately, from four to five hours earlier than we could have done had we travelled from the inn; this, with three or four hours saved at night in the same way, was a very important addition to a day, and the time thus saved, being devoted to the purpose of collecting instead of being wasted in a long and fatiguing walk to the inn, made one week as good as two. Our cooking operations were exceedingly simple, and soon accomplished: a cup of coffee was the general beverage, prepared in the course of fifteen minutes, which, with bread and butter, some fish, cheese, or cold meat, formed the usual repast; then, rolled in our "Highland plaid," we were over to sleep in a twinkling. We generally had a cup of coffee again about midnight, to warm us if we felt cold, and then slept soundly till four o'clock, when we got up and had breakfast.

There is perhaps much less danger of catching cold in this way than at first might be imagined, or even than in travelling to an inn: a long walk of some six or eight miles will very likely throw one into such a state of heat and perspiration, that unless the clothes are carefully changed, one can scarcely avoid catching cold; the sure remedy for which is another good sweat on the following day.

In the above sketch little notice is taken of the more common alpine plants, unless to point out some circumstance illustrative of their diffusion or their habits, and none of the localities visited were at all thoroughly examined. Any one who has spent a day in the mountains can readily understand how little progress is made, especially if the

Cryptogamia are included in the search. In collecting flowering-plants, one can pass over the ground with considerable rapidity; but in looking for Mosses, etc., unless every crack and crevice be carefully scrutinized, the rarer species are always certain of being overlooked. Thus *Œdipodium Griffithianum* was plentiful on the easternmost rocks of the Barries, but I saw it nowhere else in fruit, except a single small patch in the cliffs above Loch Callater. *Bryum Zierii* was plentiful in Glen Dole, but very scarce everywhere else. *Polytrichum hercynicum* was plentiful on the Barries and on the northern slope of Craig Wharl, but very scarce in Glen Dole and elsewhere. Some of the more common plants were also very fine in certain localities: thus, on the eastern stream on Craig Maid, *Luzula spicata* was remarkably luxuriant; in ascending from Canness, *Sibbaldia* was seen very fine; also *Gnaphalium supinum*, the stems five inches in length. *Rubus Chamæmorus* was nowhere so fine as on the summit of Craig Rennet and on the southern slope of Lochnagar.

Description of a New Species of ERIOGONUM, *discovered in California by* Mr. Jeffrey; *by* SIR W. J. HOOKER, K.H., F.R.A. and L.S.

(With a Plate, TAB. X.)

Eriogonum *pyrolæfolium;* radice longe fusiformi lignosa, collo diviso, caule brevissimo prope basin ramoso, ramis apicibus stellatim foliosis, foliis rotundato-spathulatis obovatisve in petiolum æquilongum attenuatis integerrimis coriaceis glaberrimis, scapis glabris digitalibus et ultra nudis, umbellarum perianthiis 6–9, bracteis 2 spathulatis, involucris brevi-campanulatis 6-dentatis, perianthii foliolis dorso ovariisque superne patenti-hirsutis. (TAB. X., inadvertently named *E. staticifolium.*)

Eriogonum pyrolæfolium, *Hook. MSS.—Murray, in Bot. Exp. to Oregon*, p. 2 (name only).*

HAB. Shasta Butt, North California, *Mr. Jeffrey.*

This is one of the results of the Oregon and Californian Mission sent out by an association from Edinburgh, for botanically exploring

* In reference to some remarks made upon this little work on some plants of the Oregon country, in a late number of our Journal, it is only fair to state, what we now learn, that it was never intended as a *publication*, but as a catalogue that might be useful to those interested in Mr. Jeffrey's mission.—ED.

those countries. The shape of the leaf is much like that of small specimens of *Pyrola rotundifolia;* and the general habit and texture and glabrous surface of the leaves resemble some *Statice.* It belongs to Mr. Bentham's section *Umbellata*, of the genus *Eriogonum*, and the affinity is perhaps with the *E. umbellatum* of Dr. Torrey: but there are no stolones in our plant, no pubescence, only two bracteal leaves, and the umbels are few-flowered. The colour of the flowers in the dried state is pale buff.

TAB. X. *Eriogonum pyrolæfolium.* 1. Involucre with its flowers. 2. Single flower:—*magnified.*

BOTANICAL INFORMATION.

Botanical News from Italy.

Florence, 11th October.

We have received the two first numbers of the 'Rendiconto della Società Reale' of Naples for this year, both containing botanical memoirs. The first is M. Semmola's account of his researches on the chemical composition of *Magnolia grandiflora:* they have led him to the discovery of a new immediate neutral principle, which he calls *Magnoline;* it is bitter, can be crystallized, and is to be found exclusively in the bark, especially of the root. The same parts of the tree contain also a little gallo-tannic acid, some resin, and two extractive substances, one of which has the property of imparting a dark violet-colour to salts of iron. It is principally to magnoline, the author adds, that *Magnolia grandiflora* owes the eminent febrifuge qualities which his experiments have shown him this plant possesses.

The second memoir contains the description by M. Briganti of a monstrosity in the fruit of *Opuntia vulgaris*, furnishing an additional proof that the inferior ovary of this plant is produced by a portion of the stem, and not by the leaves or carpels.

Professor Tenore has given in the same periodical a translation, accompanied by notes and a plate, of M. Sodoffsky's article on *Ullucus tuberosus*, published in the 'Bulletin de la Société des Naturalistes de Moscou.'

In the sitting of the 7th August, of the Accademia dei Georgofili of

Florence, a report by Professor Amici was read on the disease of the Mulberry-leaf (Bonplandia, vol. i. p. 167), and on the fungus considered to be the cause of it. This fungus was first described by Turpin in 1838, in the 'Annals of the Society of Horticulture of Paris,' vol. xxii. under the name of *Fusarium lateritium*, and a few years afterwards by Dr. Sandri. According to Professor Amici's observations, it is developed on the very surface of the leaf, and does not, as is usually believed, grow from under the epidermis. Whether it be the cause or the effect of the disease of the Mulberry-leaf, he does not pretend to decide, but *he* seems to be rather of the latter opinion; he also thinks the disease is not contagious.

Bertoloni has published another number of his Flora, containing the description of *Compositæ;* I shall proceed, as usual, to comment briefly on it. Genus *Gnaphalium:* it is made to comprise *Gnaphalium*, *Elichrysum*, *Omalotheca*, *Antennaria*, and *Leontopodium* of modern botanists; *G. citrinum*, Lam., is the name adopted for the plant usually called *G. Stœchas*, this denomination being transferred to the *G. angustifolium*, Auct.; several interesting species from the southern parts of Italy are mentioned.—*Filago: F. spathulata* and *eriocephala* are united to *F. Germanica; F. Lagopus*, Parl., to *F. arvensis.*—*Elichrysum*, this genus being limited to *E. frigidum.*—*Xeranthemum.*—*Carpesium.*—*Conyza*, combining *C. squarrosa* and *limonifolia*, and the genus *Phagnalon; P. Tenorei*, Presl, is considered a synonym of *C. rupestris*, L.—*Erigeron*, of which *Conyza ambigua*, DC. (or *E. linifolium*, W.), forms part, with *E. Drœbachensis*, Mill., added as a synonym; the *E. uniflorus* of Central Europe is joined to *E. alpinus*, and considered different from the Linnean plant; we further remark the absence of *E. glabratus* from the Italian flora.—*Jasonia.*—The new genus *Cupularia* of Grenier and Godron is adopted.—*Homogyne.*—*Tussilago.*—*Petasites*, comprising *Nardosmia.*—*Senecio: S. leucanthemifolius*, Poir., *vernus*, Biv., *humilis*, Desf., *incrassatus*, Guss., and *pygmæus*, Guss., are all joined to *S. crassifolius*, W., as Moretti and Moris have it; *S. chrysanthemifolius*, DC., is made a synonym of *S. squalidus*, L., to which is added *S. Gallicus*, Vill., as a variety; *S. Nebrodensis*, DC., Prodr., is a synonym of *S. laciniatus*, Bert., the author thinking that the true *S. Nebrodensis* of Linnæus is the same as the *S. Duriæi*, Gay in Boiss. Voy. en Esp.; the *S. incanus*, β. *italicus*, of Persoon, is the *S. Persooni*, De Notaris, and considered a good species; *S. erucifolius*, Auct., is given under the name of *S. tenuifolius*,

Jacq., the *erucifolius* of Linnæus being, according to the author, merely a form of *S. sylvaticus; S. erraticus*, Bert., is continued to be held distinct from *S. aquaticus*, which has not hitherto been found in Italy; *S. calvescens* is a rare species from the island of Capraja; *S. Jacquinianus* is joined to *S. nemorensis.*—*Aster* is the last genus described, but only in part.

I am sorry to add, Professor Parlatore's health continues unsatisfactory; he is still under medical treatment, and can study but little compared to what he was accustomed to do.

Dr. Planchon arrived here three weeks ago, and will remain with us some time, as he has come for the purpose of determining the plants cultivated in Prince Demidoff's Gardens. Mr. B. Ker, the son of the well-known botanist, and a botanist himself, is also here.—*Seemann's Bonplandia.*

Extracts from various Letters from MR. JAMES DRUMMOND, *relating to the* BOTANY *of* SWAN RIVER.

(*Continued from p.* 347.)

Hawthornden.

At our first bivouac after leaving the river and turning east, we found our intended quarters, at a spring of water, pre-occupied by a tribe of natives. We arrived before the people, and had time to observe all their spare moveable property, suspended from the trees in nets instead of the kangaroo-skin bags used by the aborigines of the Swan River district. As we expected, a little before sunset the party returned; there might be twelve or fourteen men, besides women and children. Several of them had never seen a white man before, but they were very friendly; and during the two days we stopped in the place, they often went out hunting with my son, Mr. Butcher (a young settler, who had accompanied us), and our servant. They catch a small kind of kangaroo in nets, shaped something like our common cabbage-nets, and having a running string near the mouth, which is the nearest approach we have seen the natives make to the running noose: a knowledge of which would enable them to procure abundance of food with little trouble. These little animals retreat, during the day, into dense thickets of *Eucalyptus* and other shrubs, through which the people make

beaten paths in various directions. When they have selected a place suitable to their purpose, the natives break down the shrubs and construct a sort of rough fence, placing their nets in the tracks, with the mouths of the nets open towards the thickets. The people then assemble, and disperse themselves in the opposite end of the brushwood from the traps, and set up a great noise, which induces the terrified creatures, whatever they may be, to rush towards the nets; somewhat on the principle of the Highland huntsmen, who used to drive the deer into the snare. One or more natives conceal themselves near, to watch and secure such animals as may chance to get entangled. The nets are constructed of the bark of the plant numbered 730 and 731 of my large collection, whose valuable properties for that kind of use I pointed out long ago, to our Agricultural Society: it gave me no small pleasure to see these poor creatures turning it to account. There is not however much to increase human pride in the spectacle of this slight variety of "*Homo sapiens*" in his natural state. It is true that by superior strength, aided by the little knowledge these people acquire from their ancestors, they are enabled to lord it over the other animals of the creation; but then the same spear with which they lay prostrate the kangaroo of the forest, destroys also two-thirds of their own species,—not in battle, for few, comparatively speaking, fall in fair fight, but by reason of their dark and dreadful superstition, which prompts them to avenge the death of their relations: whether caused by nature or accident, or by violence, the survivors hold it their duty to immolate some victim or victims to the manes of the deceased. There seems an analogy in this custom to what we read in Homer, of the human sacrifices offered to the shade of Patroclus. A native of this country will travel one hundred miles on foot, almost without food or rest, to murder one or more persons, generally of some tribe which he fancies inimical to him; but sooner than dispense with a victim, he, whose duty it is considered to be (generally the uncle of the departed individual), will fall upon one of his own nearest relatives. The mode is, to steal on the sleeping victim and then escape before an alarm can be raised. It follows that the friends of the murdered man speedily retaliate, after the same fashion, on some other tribe; and thus the country becomes a scene of bloodshed. If it were not for this extraordinary and shocking mode of thinning the population, this land, where disease is unknown, could never maintain its inhabitants. Only one recent instance

is known where the guilty individuals were identified and justly punished. We were about eighty miles to the north, and we passed by a place called *Calliep*, meaning the place of *the Five*, or *Five Brothers*. One of these men had accidentally been killed by the fall of a tree, and his four brothers went to the south to avenge his death, and murdered two young brothers or cousins, whom they watched till they were asleep. Their friends quickly mustered, followed, overtook and slew all the four assassins, whose land remains to this day without an owner. About twelve months ago I was travelling with Mr. Gilbert, and I discovered the skeleton of a native, the bones dragged hither and thither by the wild dogs. Our guide, Mangerroot, who also accompanied us in our recent journey to the east, told us that five years previously he and his friends were hunting damars in the thicket where I had found these relics, when they quarrelled, and a battle ensued, in which a friend of Mangerroot's was killed; but his party were eventually victors, and slew three of their opponents. After the fight was over, they buried their companion where he fell, but left the corpses of the enemies exposed to the wild beasts, and it was one of them which I had seen.

Your kindness in sending me a microscope has enabled me to detect a little Moss, which has given me more pleasure than anything I have found since the days of my discovery of *Hookeria læte-virens*, near Cork, in Ireland. This minute Moss is not only beautiful in itself, but it affords what I conceive to be an admirable illustration of a subject which it cost me much trouble to elucidate many years ago, namely, the germination of Mosses, their first and simplest form, in what I call the conferva state, and ultimately their development into what I term the foliaceous state, being that in which they produce capsules. I remember transmitting to you, many years ago, the result of my experiments on the subject, but they appear hitherto to have been little regarded: *Conferva velutina*, though undoubtedly the young of *Polytrichum aloides*, continues to figure in books as a good species; and I observe that Messrs. Bruch and Schimper, in their remarks on No. 10 of my deceased brother's 'Musci Americani,' seem to be puzzled with the conferva-like cotyledons belonging to the plant. But what are these cotyledons? simply the articulated filaments which compose the roots of Mosses, and which acquire a green colour by exposure to the light. I enclose specimens which illustrate the point. In No. 1 these jointed filaments are seen simple or branched, fringing the leaves of the peri-

chætium; the capsule is very young and globose, with a differently-shaped veil from that of *Phascum*. In No. 2 they are seen forming the articulated roots, and gradually passing into uncinate nerveless leaves. In No. 3 they are seen forming the roots; and they are so abundant in the plant in a young state, that I took it for *Phascum serratum*, till I had the opportunity of scrutinizing it with the microscope: it bears some resemblance to your figure of *Bruchia brevipes*, but it has only three nerveless leaves and some very small ones.

Are you aware that the *Hepatica*-like seed-leaves of Ferns often produce more than one plant? They are in fact a stage in the growth of these vegetables, not very different from, or rather they are analogous to, the conferva state of Mosses. *Equisetums*, too,—their curious seeds, when deposited and left quite undisturbed in a moist and congenial soil, expand in all directions like a fine specimen of *Anthoceros punctatus;* and I proved by experiments that plants of *Equisetum* did proceed from one of these *Anthoceros*-looking tufts.

One of the specimens of my little favourite *Phascum* resembling *serratum*, you will perceive, is in a more advanced stage. The capsules turn to a beautiful red as they proceed towards maturity, the colouring matter apparently residing in a tessellated membrane which lines the capsule: the veil is open on one side, and beautifully reticulated, as in *Hookeria*. The confervoid appendages no doubt remain on the plant so long as the perichætial leaves appear above ground, which in this country is not more than a few weeks.

In one station I have watched the growth of the rare *Phascum stoloniferum* for several years: I could find the fructification at all seasons. In my opinion, when Mosses are spoken of as annual, the expression only applies to their rising above the soil; and such is probably the meaning of Mr. Berkeley, when he describes *Fungi* as *annual* or *biennial*. Few plants are of shorter duration than *Agaricus campestris* in the mushroom form; yet we know that the roots of it, in the shape of mushroom spawn, are continually used to reproduce the plant, and that no deterioration thence ensues. So, in like manner, with regard to the articulated filaments which constitute the roots of Mosses, there can exist no doubt they have the power to produce the species, and for any length of time. Indeed, the experiments are conclusive on this point, which I conducted in the Cork Botanic Garden. I then raised *Funaria hygrometrica* on earth which had been made red-hot, and was

put, almost in that state, into a new flower-pot, covered with a small cap-glass, and only supplied with water through the pores of the pot. When the young plant was formed, I removed the surface an inch deep, and found the green confervoid filaments, which the plant always produces on its first appearance over ground, again produced, and in due time the leaves too. Thus a singular analogy exists between *Mosses* and *Fungi*, and I have pointed out above an equally curious one with *Ferns* and *Equiseta*.

This arid country affords few *Ferns*, perhaps because of the difficulty they experience in getting over what I term their *Marchantia* state. We have but few weeks in a year when these plants can make any progress in that stage; but, like the *Mosses*, they return, as it were, to the charge with every shower of rain. I was actually near sending you one lately, believing it to be a species of *Jungermannia!* I have watched a patch for nearly two years, and as yet only a few of them have been able to assume their *Fern* form.

Funaria hygrometrica is far more luxuriant and abundant here than in Britain, delighting to grow in the burned earth, of which we have so much. The seeds, which its numerous capsules contain, are lighter, when quite dry, than the atmospheric air which is near the surface of the earth: thus they naturally float till they find their equilibrium, when they are wafted by the wind, and, descending in rain, afford a beautiful illustration of the cause why this Moss is found all over the globe, whether the countries have risen from the sea, the work of insects, or been ejected in the form of burning lava, through the bowels of the earth.

The articulated confervoid plant, which the late Mr. Dickson called *Conferva bullosa*, but which I do not now find in books under that name, is for the same reason to be discovered in water wherever exposed to the air; for it is neither more nor less than the seeds of *Funaria hygrometrica*, which have germinated in water.

I am just returned from a journey to the north-east, undertaken principally with a view to procure seeds of my beautiful *Lawrencella lanceolata*. I rejoice to say that this object was gained, and that I also gathered several interesting plants, among them three new *Dryandras*, which, with one equally novel species, found in my expedition to the east, make no fewer than four undescribed kinds of this genus, detected by me this season. The lovely *Chamælaucium dilatatum* also oc-

curred in sufficient abundance to enable me to supply several subscribers. This plant has many points in common with *Verticordia grandiflora;* the flowers are often an inch across, with yellowish-green calyces and vermilion petals, which soon shrivel up and disappear; its anthers, twenty in number and of unequal lengths, are united by a beautiful dark purple membrane. I also found a charming little plant, allied to *Goodenovia*, about 9 inches high and bearing blood-red inflorescence; and a splendid rush-like Grass, perhaps a *Poa*. The latter grows 3–4 feet high, on the muddy banks of the Arrowsmith River; it was in flower, and had ripe seeds on it too.

As soon as I can get together 250 species, which with what I have found before will make 2000, I shall send them home, accompanied with all the seeds I can procure. Among the latter are those of a remarkably pretty *Didiscus*, allied to *D. cæruleus*, which grows a foot high. I hope to add some bulbs, but these are rather scarce; and our opportunities of sending are still fewer.

[A month later Mr. Drummond writes] At last I have the satisfaction of despatching a box on board the ship Halifax, which is to sail from Freemantle, and to touch at the Isle of France on the way to England. It contains bulbs of several kinds of *Drosera* and *Hæmadorum*, also of the bulbous-rooted umbelliferous plant called *Canna* by the natives: seeds of the *Lawrencella lanceolata*, both rose-flowered and white, our elegant yellow capitate Everlasting-flower, and the fine annual *Brunonia*. There are dried specimens of more than 200 species, collected during my late journey, for your herbarium, and some letters which describe the more remarkable plants. I think you will consider two beautiful and new *Leguminosæ*, a scarlet-flowered *Myrtacea*, and the *Goodenovia* mentioned in my last, as among the best things.

This country abounds in species of *Dodder* and *Chara*, apparently quite peculiar to it; but a travelling botanist cannot investigate these difficult genera so closely as is necessary to authorize his founding new species of them; and I am always reluctant to increase the number of species to my subscribers unless on ample grounds. I feel sure this colony contains twice as many kinds of plants as I have as yet discovered. In Dr. Lindley's 'Observations on Swan River Botany,' he mentions that *Dryandras* abound; but though I was always on the look-out for this genus and *Banksias*, I spent seven years at Swan River before finding seven *Dryandras*. Now I have gathered upwards of

forty species; but a third of the number are entirely confined to one locality, and of the remaining two-thirds only two or three species are generally distributed over the country, even where there is the same soil and situation to be found. The way in which plants seem to be restricted to certain spots, is one of the remarkable features of this country. Dr. Lindley much underrates the extent of the colony. Instead of fifty miles, it stretches from Doubtful Island Bay on the south-west coast to Sharks' Bay, including the land taken in by parallel lines of latitude and longitude. When we consider the great number of one species known to grow only in one spot, and these spots exhibiting no very remarkable conditions of land and aspect, etc., it is impossible to calculate the amount of novelty which might reward the researches of a naturalist, who should traverse the country in various directions in the length and the breadth of it.

I enclose in this letter specimens of twelve or thirteen *Characeæ;* and as I have found by experience that these kinds of plants lose (not to regain it) their original form in the process of drying, I give you the result of some observations which I made upon them in a fresh state. Mr. Brown, in describing the only two species noticed in the 'Prodromus,' appears to consider the nakedness of the lower part of the stems, and the distance of the whorls of leaves or branches, as affording important distinctive marks. But in our species these points are highly variable, and seem dependent upon circumstances, as the depth and stillness of the water which they inhabit. Two kinds have beautifully iridescent stems: some species have the anthers and capsules borne upon separate plants, and they appear to be productive or otherwise, according as they grow in proximity with each other or not; one seems nearly allied to the *Chara latifolia* of your 'Icones Plantarum.' I will endeavour to send specimens in spirits, for there is no other way of preserving the original aspect; but everything connected with these matters is of difficult attainment in this country: for instance, my stock of brown paper is expended, and till I can receive more from England (I have written for a supply) I must be at a standstill. The article is not to be had for love or money in Swan River, and from this cause many of my specimens have been imperfectly dried: I had hoped to receive some by the Prima Donna. Perhaps my letter, asking for it, has never reached England. It is one of the greatest disadvantages of Swan River, that two years are necessary for us to send a letter and receive the answer; and matters get worse instead of better in this

respect. By the Halifax, as I lately informed you, I despatched a box: perhaps you have heard of the disaster that befell this vessel; she was driven on shore soon after sailing, and so much injured that it was found necessary to put back for repairs. I trust that nothing worse than delay has happened, and that the articles will yet arrive in good order.

Herewith I send some slices of several subterranean *Fungi*, which, uninviting as they look to an epicure, are highly esteemed by our fungivorous animals, whose scraping has led me to detect their concealed habitat.

Soon after the date of my last letter, an event occurred which plunged us all in the deepest affliction, and took me quite off my usual pursuits. My youngest son was murdered by a native, who speared him through the body as he lay asleep, at the Sheep Station, on the Moor River. The books and microscope you sent me have proved the means of somewhat alleviating my grief, by inducing me to attend to botany; and I have occupied myself in sowing the seeds of obscure Cryptogamous plants, *Marsileaceæ* and *Characeæ*. If you happen to have any living plants of *Marchantia polymorpha*, I wish you would kindly send me a frond or two, with the cup-bearing sporules, in a letter, I think they would germinate in this country.

It is an extraordinary fact that I have known the anther to exert its influence on seeds of *Marsileæ*, which must have lain in the ground for a vast and unknown period of time. These seeds, or involucres, were dug up when sinking a well on the alluvial banks of the Swan River: they were mixed with charcoal; for charcoal is invariably found in the alluvial deposits of the rivers in this country, to a depth which seems to prove that the present race of natives, or others having a similar habit of annually burning the country, must have inhabited these districts for a much longer period than can be ascertained of any set of people, not excepting the Chinese.

I have now decided, after the first rains, which will fall in a month or six weeks, to start for the south and east. The Stirling Range, extending from the head of the Gordon River to Cape Rich, has scarcely been visited, and I am in hopes of getting some interesting plants. There is little doubt that the country towards the north, in the interior, produces most species, even of *Proteaceæ;* but the natives in that part of the country are a treacherous and undependable set. With such

protection as I am likely to obtain, Lucky Bay would be an excellent station: I may probably make my way thither, on board an American or French whaler.

Some months ago, when I was dissolving some *Acacia* gum, which had been for three-quarters of a year in my possession, I noticed that it contained seeds of the beautiful *Loranthus* which grows on our *Acacia.* They seemed so fresh that I placed them on the bark of a tree in the neighbourhood, where they quickly germinated. I have accordingly coated some seeds with gum, and I send them in the expectation that you will find them succeed in England. The species is not only among the most beautiful of our *Loranthi*, but it exhibits a highly curious structure, and is of extremely easy cultivation. It is a mistake to suppose that the *Loranthus* takes root in the trees whereon it grows. The mode of attachment is precisely that of a bud to the stock in which it is inserted. The unknown influence which these parasites exert on various trees, thence deriving their very existence; is, no doubt, among the hidden secrets of Nature; but it is easy to perceive that, in effecting the union, it is the tree which constitutes the active agent, its bark, sap, and wood projecting always from the branch, on whatever side the parasite may happen to be placed. *Acacia acuminata*, *A. stereophylla*, and *A. Meisneri*, produce the *Loranthus;* but by far the most magnificent specimens, both for the size and brilliancy of their scarlet flowers, are grown on *A. cyanophylla.* I will shortly send a series of specimens that shall exhibit these plants in a germinating state, and also show the junction of the wood of them, with the trunks which they inhabit.

JAMES DRUMMOND.

Plants of the Indian Archipelago.

Le soussigné a l'intention de publier un catalogue exact des collections de plantes faites dans l'Archipel indien (et en partie de celles provenant du Japon).

Mes herbiers des Indes contiennent plus de 5000 espèces, de sorte que le catalogue montera à plus de 5000 numéros, et que, par conséquent, il n'aura guère moins de 20 feuilles in 8°. Comme la publication d'une pareille spécialité est chose difficile à plus d'une raison, l'auteur s'est décidé à ne demander aucun honoraire, et je dois prier Mes-

sieurs les souscripteurs de vouloir payer les frais de port et d'expédition, qui se fera autant que possible par l'intermédiaire des libraires. Il est impossible de fixer dès à présent le prix de l'ouvrage. Il dépendra du nombre des souscriptions, et il pourra monter, en cas de 100 à 150 souscriptions, à 50 centimes par feuille; en cas de 150 à 200, à 40 centimes; en dessus de 200, à 30 centimes. Le prix de librairie sera au moins aussi élevé que celui résultant d'une souscription au-dessous de 150 exemplaires.

J'ai l'honneur de remarquer ici que plusieurs savants distingués ont bien voulu s'occuper de la détermination d'une grande partie de mes plantes; ainsi je nomme pour les *Algæ*, d'abord M. Kützing, puis M. Sonder à Hambourg. *Lichenes*, d'abord M. Schärer, puis Dr. Hepp, à Zürich. *Fungi*, Dr. Léveillé, à Paris. *Hepaticæ*, d'abord M. Lichtenberg, puis M. Gottsche, à Altona. *Musci*, M. Duby, à Genève. *Filices*, M. Kunze, à Leipsic. *Glumaceæ*, Dr. Steudel, à Esslingue. *Orchideæ*, Dr. Reichenbach, fils, à Leipsic. *Monochlamydeæ* (la plupart), Dr. Miquel, à Amsterdam. *Compositæ*, Dr. Schultz, bipont. *Orobancheæ* et *Violarieæ*, M. Schultz, jun. *Symplocos* (le genre), M. Choisy, à Genève. *Ericaceæ*, M. le Pr. Klotszch, à Berlin. *Alsineæ* et *Portulaceæ*, M. le Pr. Fenzl, à Vienne, etc.

MM. les botanistes, qui veulent m'honorer de leur souscription, sont priés de vouloir faire connaître exactement leur nom, domicile, le nombre des exemplaires désirés, par lettre affranchie, soit à M. Kiesling, imprimeur et éditeur, à Zürich, soit au soussigné.

H. ZOLLINGER,

Kusnach, près Zürich, le 18 Juillet, 1853. *Directeur de l'Ecole Normale.*

LEUCODON LAGURUS *discovered in Scotland.*

Our excellent friend the Rev. Colin Smith, Minister of Inverary, Argyleshire, has had the good fortune to detect a new Moss in Scotland, and one which was little to be expected in any part of the northern hemisphere,—*Leucodon Lagurus* of our 'Musci Exotici,'—such at least it has been pronounced to be by Mr. Wilson; a native of Cape Horn (*Menzies*), Campbell's Island (*J. D. Hooker*), and mountains of Van Diemen's Land (*R. Brown*). This discovery was made in 1851, in the Island of North Uist (one of the northern Hebrides). It grows on the farm of New Town, close to Bernera, on a rock with a western aspect,

in tufts about the size of a saucer, occupying the very edge of the soil, where the latter meets this. Unfortunately no fructification was detected: that we trust is left to reward the researches of some future botanist, who may be led to visit this position of the storm-swept Hebrides.

NOTICES OF BOOKS.

SEEMANN, BERTHOLD: *The Botany of the Voyage of* H.M.S. HERALD, *under the command of* Captain Henry Kellett, R.N., C.B., *during the years* 1845–51. Part III., 4to, with Ten Plates.

We are glad to be able to announce the appearance of the Third Part of this important work, with its accompanying beautiful plates, and continuation of the Flora of the Isthmus of Panama, including the families *Caryophyllaceæ* to *Onagrarieæ* (following the Orders of De Candolle), and containing a very interesting account of the "*Cedron*" (Simaba Cedron, *Planch.*) of New Granada. Equally glad, too, are we to be able to state that, "in consideration of his eminent services in the cause of science as an author and traveller," the University of Göttingen,—his Alma Mater, we believe,—has conferred the degree of Doctor of Philosophy on the author.

Pflanzenverbreitung und Pflanzenwanderung, eine botanische geographische Untersuchung; von HERMANN HOFFMANN, Dr. Med. etc. Darmstadt, 1853.

Under this title we have received a pamphlet by Dr. Hoffmann, which constitutes a very interesting contribution to the important question of the geographical distribution of plants. To this subject the author seems to have devoted much attention; and the results at which he has arrived, by a painstaking collection of the areas of distribution of Phanerogamous plants in North Germany, are highly deserving of the attention of students of this branch of botanical science, though they may in many instances dissent from his special conclusions.

The author commences his paper by passing in review the questions

of climate and soil, which are generally considered to exercise so much influence in the distribution of plants. With respect to the former, without denying the broad fact that some plants are adapted to tropical and others to temperate climate, he questions the applicability of this cause as an influential agent in limiting the distribution of plants within limited areas, and especially within North-west Germany, the district to which his investigations particularly refer. He even goes so far as to consider that the north-easterly line which bounds the areas of certain species, and which is usually considered to indicate a demarcation between the more humid climate of Western Europe and the continental climate of the east, is in Germany more properly to be explained by the trending of the land to the north as we advance to the eastward; so that species, which descend from the high lands, have so much greater distance to travel by water in order to reach the sea the further east we go, on which account their northern limits naturally tend to arrange themselves in lines facing north-west. He then proceeds to argue that there is something forced in the conclusion that species which extend for many hundred miles to the south and east, and are by no means restricted in altitude, and which grow with facility under cultivation in all parts of Europe, should grow abundantly in Middle Germany, and stop abruptly at a line drawn through the towns of Bonn, Hanover, Stettin, although the climate of the tract to the northward of that line has a barely perceptibly less mean temperature than the more southerly districts. This he finds to be the case with a very large number of German plants; and as he cannot believe that the climate alone could cause them so suddenly to disappear, he dismisses it entirely as an influential agent in regulating the distribution of plants.

The nature of the soil he is disposed to consider still less important, and he points out the many inconsistencies into which the advocates of the limitation of plants to peculiar soils are led by the great admixtures which exist in all soils, and by the occurrence of those plants, which in warm climates grow only on clay, in damp, humid, and cool climates on calcareous soils; and he comes at last to the conclusion, that, however the nature of the soil may affect the luxuriance of a plant, it can exercise very little influence on its occurrence or distribution.

He then proceeds to explain in detail his own peculiar views, and to give at length the grounds by which he believes them to be supported;

starting from the foundation that the present vegetable world is not to be considered as having been created on the spot on which it now grows, but that, as in the animal kingdom, species must be considered to have descended from more or less remote tertiary periods, since which the surface of our continent has been subject to a very great amount of change. The whole of Germany, he states, is considered to have arisen gradually from the sea since the beginning of the tertiary epoch, and the great valleys are believed to have been occupied during the period of emergence by arms of the sea or fresh-water lakes, gradually diminishing in size and in the height of water-level. In investigating the mode of entrance of plants into the tracts laid bare by the elevation of the land, he feels compelled to select one of two principal modes of transmission—either by land or by water; and both by *à priori* reasoning and by a series of illustrative facts, be believes that he has proved that it is by means of water-carriage that the principal immigration of plants has taken place. The *à priori* arguments are naturally of less weight and novelty, relating chiefly to the non-correspondence between facilities of aerial transport and rapidity of introduction, and to the small amount of dispersing power which is exhibited by plants in isolated localities. These are to us not convincing; but we need not here controvert them in detail, as counter-facts in abundance will suggest themselves to all students of geographical botany. The illustrative facts which the author has brought to bear upon the question of water-transport are, on the contrary, the most interesting and valuable part of the work before us. They consist of a detailed list of 125 species of plants, which are common in all parts of the district of the Middle Rhine and of its tributaries, up to an elevation of 1000 feet above the level of the sea, but which are not found in any part of the middle or upper valleys of the Weser, a river whose sources have no connection with the mountains of South Germany: these he therefore supposes to have immigrated by water from the high lands of Switzerland and South Germany, after the ridge of land which separates the Weser valley from that of the Rhine had been elevated above the level of the sea.

On the preparation of these lists of species great pains have evidently been bestowed, and they may (as far as the German flora is concerned) be considered as critically accurate. To enable the author to ascertain the main facts of geographical distribution, the West German localities of every species of phanerogamous plant which is indigenous in the

Grand Duchy of Hesse were noted, each on a separate map, and from the whole the most remarkable were selected as special instances;—not by any means, we are informed, as a complete list of all the species which are natives of the Rhine valley and absent from that of the Weser, all those being excluded whose specific identity is open to doubt, as well as a considerable number which have been erroneously stated by authors to be natives of some parts of the Weser district, though well enough ascertained not to be so.

On the question of the sufficiency of the evidence on the authority of which these 125 species are stated to be absent from the district of the Upper and Middle Weser, we cannot be expected to express an opinion. Their absence is in every instance stated on the authority of three botanists, all of them the authors of local floras, and one a botanist of first-rate critical accuracy. Dr. Hoffmann appears to consider that the district is so amply explored, that no doubt can be entertained in the matter; and without pledging ourselves to the belief that this will hold good in all cases, we may fairly enough assume that in so well-botanized a country, and out of so large a number of plants as 125, a very large proportion could not have been overlooked. We have therefore the very remarkable fact, that on a tract of comparatively speaking level country, with no alpine tracts intervening to prevent the migration of plants, a notable number of species have been utterly unable to pass over a low watershed, while they have spread throughout the Rhine valley in all directions, ascending the tributary streams on both sides, as far as the height to which the species is in the habit of growing.

It must be confessed however that a survey of this list of 125 names shows a great part of it be composed of southern forms; and even on a cursory inspection a good many of the species therein contained appear to have been inserted rather incautiously, and tend to a certain extent to neutralize the weight of evidence: we find, for example, *Acer Monspessulanum*, *Prunus Mahaleb*, *Lavandula vera*, *Scrophularia canina*, and *Muscari botryoides*, all species which are characteristic of the south of Europe. The list also includes *Gentiana utriculosa* and *Geranium macrorhizon*, doubtful natives, we fear, of any part of North Germany; *Ervum Ervilia* and *Amaranthus retroflexus*, both, we presume, only naturalized; the anomalous *Samolus Valerandi*, and such minute and local plants as *Malaxis paludosa* and *Elatine hexandra*. These however are

exceptions to its general aspect, and all the species which it contains are worthy of a careful analysis. We find, on the data contained in the list itself and in such German floras as are at hand, that of the 125 species enumerated 52 are natives of Saxony, and 29 only of Hamburgh, Holstein, or Denmark. Both these numbers are possibly rather too low; but if we make an allowance for naturalized species, a considerable deduction will be required, so that these numbers suffice to show the general southern nature of the forms. Only 50, or less than one-half, are natives of Britain; and of these at least 28 are confined to the extreme south of our island, and are therefore affected in their distribution by some cause or other, in the same way as in Germany. Several of the others, such as *Wahlenbergia hederacea* and *Hypericum Elodes* are western forms; and scarce one, except *Carex stricta* and *Potamogeton densus*, is a common British plant.

While therefore we regard such careful observations as those of our author as of great value to the student of geographical botany, we feel by no means disposed to depreciate so much as he does the influence of climatic conditions on the vegetation on our globe. It is no doubt difficult to explain in what manner the organization of a plant is affected by nice shades of difference of temperature or humidity. The fact is, however, well established as between tropical and temperate climates; and the usual explanation seems quite satisfactory, that impaired vitality at last becomes incapable of contending against more powerful competitors in the struggle for space which is constantly going on between one species and another.

Dr. Hoffmann draws, as a further conclusion from his comparative list of species, that the highest levels at which plants are found on the hills surrounding the Rhine valley will in a great many instances be found to correspond at great distances; and he is of opinion that this result is due to the level of the lake or sea which at the time of their introduction occupied the valley, believing, as we have seen, that transmission by means of water is the only energetic means of dispersion of plants, and that they are incapable of extending to any distance in any other way. Impressed with this view, he takes a rapid survey of the geographical history of Germany since the beginning of the tertiary epoch, and speculates on the relation of the flora to the periods of emergence. Into this it is unnecessary to follow him, as such speculations are not capable of any close reasoning in the present state of our geological

knowledge, and are therefore of little practical benefit. In such speculative subjects, indeed, the views of matters of detail adopted by each writer, must depend on his views of the sequence and importance of geological events. Our author, for instance, considers it probable that a considerable number of evergreen trees indigenous in the Rhine valley are survivors from the miocene period,—a view which we think wholly untenable, if he means to imply that any part of the now-existing vegetation has retained its position where it now grows since so remote an epoch. On the contrary, we believe that since the most recent tertiary period, the great refrigeration of our climate which must have accompanied the glacial epoch is quite incompatible with such a vegetation, and that our whole flora, except a few alpine species, has probably been introduced since that time.

We are sorry to find, in a general work devoted to geological questions relative to the distribution of plants, no indications of an acquaintance with the very important labours of Lyell and Forbes. The masterly summary of the whole question by Sir Charles Lyell, in his 'Principles of Geology,' is based upon a great accumulation of facts, and a complete knowledge of the amount of geological changes; while in the memoir by Professor Edward Forbes, on the vegetation of the glacial epoch, we have the application to a particular geological period of the author's extensive knowledge of zoology and botany; and both these writers have treated the subject with so much completeness, that their papers may be considered the foundation of all accurate discussion on the subject.

We regret also to observe a tendency, on the part of the author of the pamphlet before us, to place a degree of reliance on the identification of fossil species of plants with those now existing, which we do not by any means think the materials usually at the disposal of fossil botanists can warrant. Every one who is accustomed to the handling of large masses of plants, must have felt the great difficulty of referring specimens without flowers or fruit to their Natural Orders. How much more difficult, then, must it be to identify fossil specimens, chiefly single leaves, with living species!—a thing now often done, with the utmost confidence, on exceedingly slender grounds. We should not like to be obliged to distinguish fragments of dried specimens of *Pinus Pumilio* from *Pinus sylvestris*, or from a great many other Pines; and yet our author tells us, on the authority of Göppert, that the former of these so-called

species is found in miocene strata in Germany. Such hasty references are, in our opinion, particularly dangerous, and likely to lead to a great deal of mischief.

Some curious experiments on the floating power of seeds, and on their vitality after long immersion in water, are also deserving of mention. Of 870 seeds selected from the most different natural groups, immersed in water for three weeks, 684 had sunk to the bottom, while 186, or more than one-fifth, continued to float. Out of the whole number, only 54, or very little more than six per cent., vegetated; of these, 28 had sunk to the bottom, and 26 were of the number which had floated. These numbers correspond to a proportion of four per cent. of the seeds which sank, and fourteen per cent. of those which floated.

TORREY, DR. JOHN: *Plantæ Frémontianæ; or, descriptions of plants collected by* Col. J. C. Frémont, *in California.* 4to. Washington City. (Smithsonian Contibutions to Knowledge.)

Here are ten figures, and as many admirable descriptions, of Californian plants, a portion of the collections of "Colonel, Frémont, whose important services to science are known to all who have read the reports of his hazardous journeys. He has not only made valuable additions to the geographical knowledge of our remote possessions, but has greatly increased our acquaintance with the Geology and Natural History of the regions which he explored. His first Expedition was made in the year 1842, and terminated on the Rocky Mountains. He examined the celebrated South Pass, and ascended the highest mountain of the Wind River Chain, now called *Frémont's Peak.* The party moved so rapidly (travelling from the frontier of Missouri to the mountains, and returning in the short space of four months), that much time could not be allowed for botany. Nevertheless a collection of three hundred and fifty species of plants was made, of which I gave an account in a botanical appendix to his first Report. The second expedition of Colonel Frémont, that of 1843 and 1844, embraced not only much of the ground which he had previously explored, but extensive regions of Oregon and California. In this journey he amassed large collections in places never before visited by a Botanist; but, unfortunately, a great portion of them were lost. In the gorges of the Sierra Nevada,

a mule, laden with some bales of botanical specimens, gathered in a thousand miles of travel, fell from a precipice into a deep chasm, from whence they could not be recovered. A large part of the remaining collection was destroyed on the return of the Expedition, by the great flood of the Kansas River. Some of the new and more interesting plants that were rescued from destruction, were published in the Botanical Appendix to Colonel Frémont's Report of his second Expedition.

"Very large collections were also made in his Third Expedition, in 1845 and the two following years; but again, notwithstanding every precaution, some valuable packages were spoiled by the numerous and unavoidable mishaps of such a hazardous journey. Very few of the new genera and species that were saved have as yet been published, excepting several of the *Compositæ*, by Dr. Gray, in order that the priority of their discovery might be secured for Colonel Frémont. There was still another journey to California performed by that zealous traveller,—the disastrous one which commenced late in the year 1848. Even in this he gleaned a few plants, which, with all the others, he kindly placed at my disposal. I had hoped that arrangements would have been made by the Government for the publication of a general account of the Botany of California; but as there is no immediate prospect of such a work being undertaken, I have prepared this memoir on some of the more interesting new genera discovered by Colonel Frémont." Such are the particulars given in the preface by Dr. Torrey.

The first plant figured and described is *Spraguea umbellata*, a curious Portulaceous plant, with very large membranaceous, imbricated calyces, arranged in umbellate spikes. The genus is named in compliment to Mr. Sprague, the talented botanical artist. 2. *Frémontia Californica* (the former genus *Fremontia* is now *Sarcobatus*), a beautiful shrub allied to *Cheirostemon*. 3. *Libocedrus decurrens**, Torr., a noble tree 120–140 feet high, found in the upper waters of the Sacramento. 4. *Coleogyne ramosissima*, Torr., a new genus, allied to *Purshia*, in *Rosaceæ*. 5. *Emplectocladus fasciculatus*, Torr., another new Rosaceous genus. 6. *Chamæbatia foliolosa*, Benth., Pl. Hartw., again an exceedingly curious shrub of *Rosaceæ*, with leaves very compoundly divided, almost like those of some *Pedicularis*. 7. *Carpentiera Californica*, a new genus

* This has since appeared under the name of *Thuja Craigana*, in a little pamphlet, edited by Mr. Andrew Murray, containing notes on a "Botanical Expedition to the Oregon," with a coloured plate.

allied to *Philadelphus*. 8. *Hymenoclea Salsola*, Torr. et Gr., allied to *Franseria*, in *Compositæ*. 9. *Amphipappus Frémontii*, Torr. et Gr., a *Composita*. 10. *Sarcodes sanguinea*, Torr.; a new genus between *Hypopithys* and *Schweinitzia*. The memoir contains many interesting and valuable remarks on allied genera.

MOORE, THOMAS, F.L.S.: *The Handbook of* BRITISH FERNS; *containing scientific and popular descriptions, with engravings, of all the indigenous species and varieties, with instructions for their cultivation.* Second Edition. 12mo. London: Groombridge and Sons, and W. Pamplin. 1853.

In the volume of our Journal for 1849, we had occasion to speak favourably of the first edition of this little duodecimo: the present is a new edition, much and advantageously enlarged, upon superior paper, and with additional woodcuts. The work treats of the structure as well as cultivation of British Ferns: and in regard to classification and nomenclature, the author says in the Preface—"Those I adopted in the former edition are substantially retained in the present; for although in these matters some novel schemes have been proposed, yet the suggestions which have been made, appear to be little else than ingenious devices, tending to render the study of British Ferns" (and not of British alone) "more difficult and involved."—In proof of this, and as examples of the rage for multiplying genera on slight foundations, one has only to take up the recent works of Presl and Fée, to see the love of change in the arrangement and nomenclature of Ferns exhibited in the highest degree. It is not that Mr. Moore would be neglectful of any peculiarities in the plant, whether in general habit or vascular structure; but undue importance is not given to them.

We think some of the figures in the present edition may lead to error by the affixing of names (upon the plate) to *varieties*, as if they were considered by the author as distinct species. For example, a "*Lastrea collina*" is figured; but in the descriptive portion this is only a variety (we fear a very slight one, too) of *L. dilatata*. The genus *Woodsia* has but two species, *W. Ilvensis* and *W. hyperborea*, and the synonyms of the latter include *W. alpina*, Newm., as a mere variety; but in the woodcut it stands as "*Woodsia alpina*," etc., etc. In some cases the figures of varieties are rightly enough distinguished as such.

P. Reeve imp

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Fitch del et lith

Fitch del et lith. F. Reeve imp

Tetracrypta cinnamomoides, *Gard. & Champ.*

Fitch, del et lith.

F Reeve imp.

Kokoona zeylanica, *Thw.*

Drapetes Tasmanica, *Hook. fil.*

Fitch. del et lith.

F Reeve imp.

Thryptomene micrantha, *Hook:fil.*

Fitch del et lith.

F. Reeve imp.

Milligania longifolia, *Hook, fil.*

Fitch, del. et lith.

F Reeve, imp.

Eriogonum staticifolium, *Hook.*

Fitch, del. et lith.

F. Reeve, imp.

Polypodium (Phymatodes) Lobbianum, *Hook.*

Fitch, del. et lith. F. Reeve, imp.

Horkelia Gordoni, *Hook.*

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